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ANCIENT EGYPT AND THE EAST

1935. JUNE. PART I.

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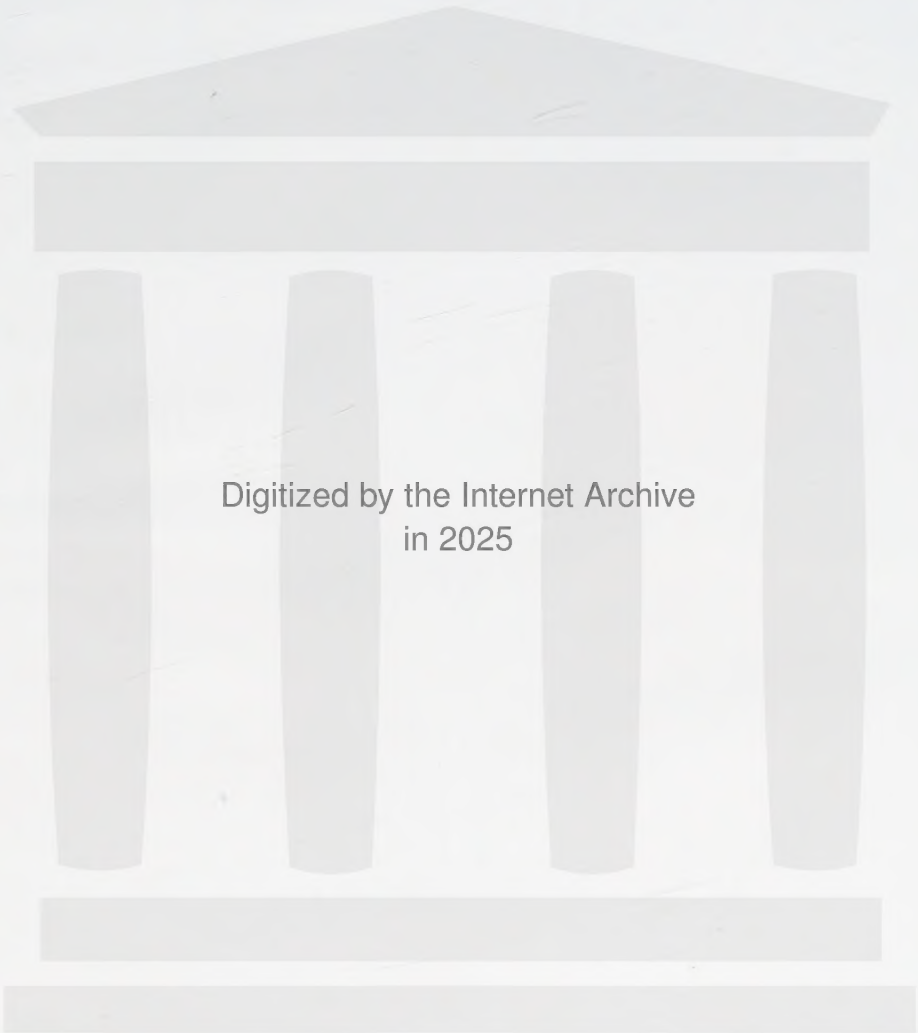
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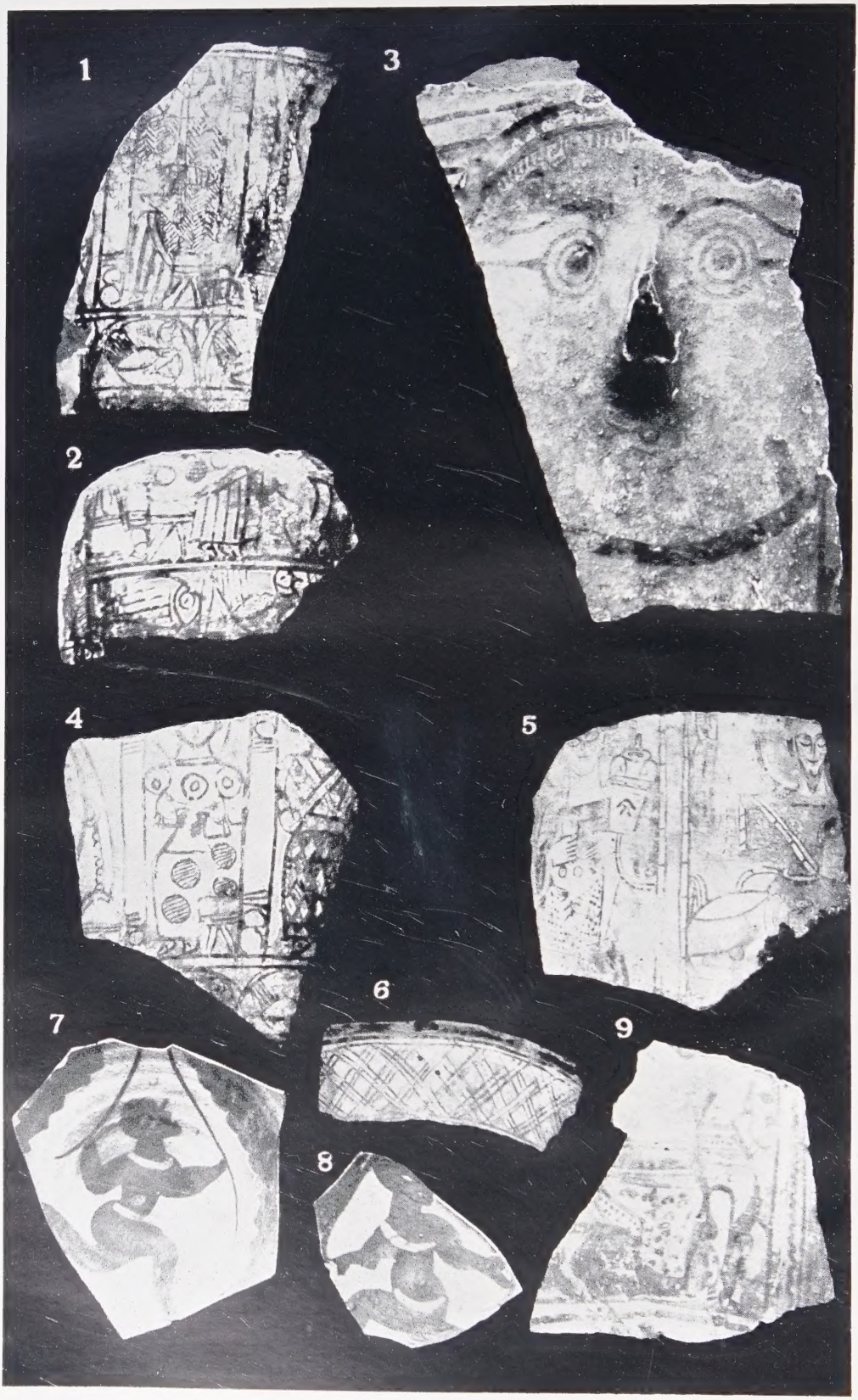


PLATE I.

COPTIC PAINTED POTTERY.

ANCIENT EGYPT
AND
THE EAST

COPTIC PAINTED POTTERY.

[*Note.*—In the line drawings red is indicated by heraldic shading ||||||||||.]

LITTLE has hitherto been written on Coptic painted pottery; in fact, except for the language, the textiles, and a little of the church architecture, the Coptic period is archaeologically almost an untouched field. A careful study of Coptic art in its various phases might very well throw light both on the influences which brought it into being and the effect it had on contemporary art elsewhere. The influence of Egypt on the early Christian Church in the East was very great; and though that influence was lessened by the internecine strife between the Melkite and Jacobean factions, the individuality of Coptic art was never lost. It has continued to the present day, and must have affected the art of the Mahomedan period either directly or indirectly. These are points which no archaeologist has yet tackled. Nothing, moreover, is known of the social conditions and social history except from the scanty literary remains, and these refer chiefly to religious matters and religious houses. The exact dating of Coptic pottery is still unknown; excavators usually disregard Coptic pottery, and, if they preserve it, the associated objects are not recorded; museum authorities refuse to accept it or relegate it to store-rooms. In short, the Coptic period is the Cinderella of Egyptological studies.

In the few examples published here (all from the Petrie Collection at University College) two classes can be distinguished, the ecclesiastical and the secular.

In pls. I, 1–6, 9; IX, 1–5, are fragments of three large vessels of the same type though of different dates; the form of one of the vessels is shown in pl. X, 6. The ware is coarse and heavy, the surface is red with a narrow black core, and the walls of the vase are 7 mm. thick. In all three examples there is a wash of white over the whole surface of the vessel and the design has been worked out in black outline, the colour having now faded to a dark brown.

The earliest of the three (pls. I, 5 ; IX, 1) is a large fragment on which two figures remain. The field of the vase was originally divided into panels, as in the case of the more complete vessel, each panel containing a single figure. On the left is a youthful ecclesiastic, fully and richly robed ; in the crook of his left arm he holds what appears to be a gigantic dagger, perhaps the instrument of his martyrdom. On the right a bearded figure rides on a horse, of which only the hindquarters remain. This is probably a military saint, for he wears a costume which is not sacerdotal. The firmness and delicacy of line should be compared with the much cruder work of the second vase. The method of representing the eyes also differs from the second vase, and the hands are recognisable as parts of a human being.

(Pls. I, 1–4, 6 ; IX, 3–5). This is a remarkable vessel on account of the mixture of painting and modelling as seen in the woman's face, where the nose appears to form a kind of lug handle, which is seen in the outline of the vessel (pl. X, 6). There was certainly a similar face on the opposite side of the vase, for a ringlet, one earring and a few of the forehead curls still remain. The panel decoration is like that of the vase described above, but the dividing lines lack the simplicity of that example. Below the panels is an arched border, each arch filled by a bird or a fish. The figures in the panels are of male saints. They are clothed in elaborate ecclesiastical garments, and are represented as seated on stools, the legs being in profile while the faces and upper parts of the bodies are turned to the spectator. The beardless figure playing on a long flute may perhaps be recognisable when the iconography of the period is studied. The painting of the eyes of the woman's face is entirely un-Egyptian ; the two concentric rings with central dot is a method of representing the eye not known in pre-Christian Egypt and is probably an introduction from elsewhere. The long horizontal line from the eye to the temple is, however, reminiscent of pharaonic art. The hair also, both the fringe and the ringlets, are not painted in the ancient manner. The decorated rim of the vase (pl. I, 6) shows a basket-work design. From the style of painting and design, this vase is later in date than the one described above.

Pl. I, 9 (see also pl. IX, 2) belongs probably to a similar type of vase, but the technique and style of the painting indicate a different provenance and perhaps a different date. The ware is 14 mm. thick and coarser than the other two examples ; it has a thick black core. The whole surface was covered with a wash of white now turned by age to a pale drab ; the outlines are in blue-black and are thick and coarse, without any of the delicacy of no. 5 in pl. I. The background was painted in bright red, the figures being left in the pale drab of the surface colour.

Faces in relief on vases have never been common in ancient Egypt, but they are not rare on Coptic pottery. The example in pl. II, 2, is fairly early ; it is part of the rim of a vase of red pottery which was covered with a wash of white. The nose, eyes and hair are raised above the surface of the vase ; the eyes are indicated by concentric circles, as in pl. I, 3 ; the curls of the hair are shown as incised circles. The fragmentary condition of the face makes it impossible to determine whether the lower ringlets represent hair on a female head or whiskers on a male face.

The two-handled vase (pl. VII, 2) has a crude representation of a human face in relief immediately under the rim. The eyes are represented by raised rings as in the example in pl. II, 2. There is a depression in the centre of each

PLATE II.

eye, surrounded with a circle of black. Though the vase is of the same ware as those in the same plate, it is probably of rather earlier date, as is suggested by the form of the vessel with overhanging rim and handles attached to the neck.

A small part of a very large vase (pl. III) shows an unusually rich decoration. The diameter of the rim is about 50 cm.; the ware is coarse, 20 mm. in thickness, with a thick black core. The body of the vase is slightly polished, but the neck has a matt surface. The peculiarity of the decoration is the row of heads in relief round the neck; the height of the largest of these heads is 13 cm. Though the faces have been entirely destroyed there are indications that they were painted white and there are traces of black on the hair, but the coronet round the head is uncoloured. On the body of the vase the design is of panels of irregular sizes, each filled with a single spiral. Above these are arches, the upper band of which is red, the lines being in black. At the junction of the arches is a tall cross.

The base of a fruit-bowl (pl. X, 5) is decorated on the stem with lines of black and red. The ware is fairly fine and is sufficiently well baked to be red throughout; the thickness is 4 mm. The surface is covered with a pinkish wash. At the middle of the bowl (pl. IX, 6) is a painting of a woman's face in outline, with the eyes and hair in solid colour. The type of face is not Egyptian, the eyes are unusually large, the hair is clearly short; round the neck is a close necklet, and the material of the dress is indicated by wavy lines suggesting soft folds. There have been other details on each side of the head, but the outer part of

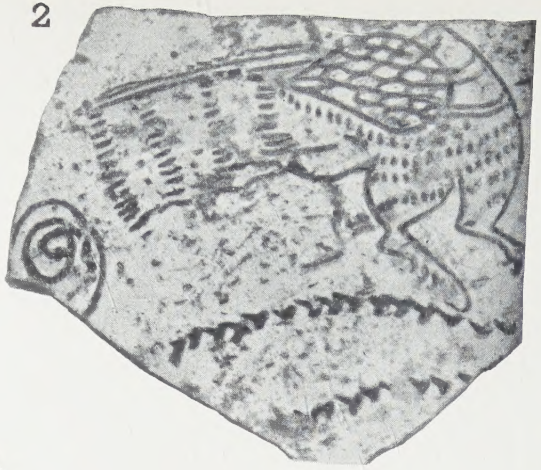
the bowl is broken away completely and nothing now remains but an indeterminate blotch.

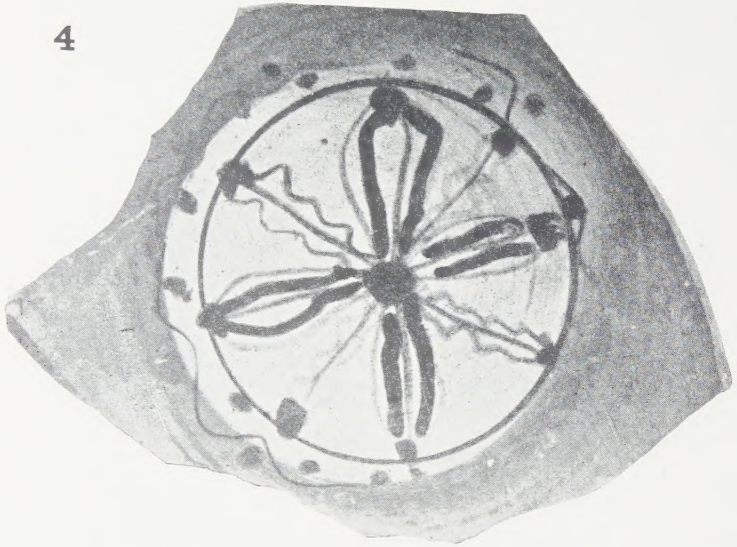
Another figure of a woman is also from a bowl (pl. II, 4). Though only the upper part remains, the position of the figure on the bowl shows that it was standing. On each side are palm-branches which seem to represent a bower in which the woman stood; they are not the palms of martyrdom as there is no halo round the head. The technique of this crude painting is entirely different from the head in pl. IX, 6; the paint is laid directly on the pottery and not on a wash of another material, the eyes are in outline, the hair is represented by strokes of the brush and not painted solid, but the body is in solid black with no representation of a garment. The style of representing the hair and eyes differs also from the woman's face on the large vase (pl. I, 3).

PLATE III.

In all these pieces where a human being is represented the face is turned to the spectator. This fact alone shows that Coptic art is not the descendant of the art of ancient Egypt, but derives from some foreign source, probably Greek or Roman. It is usually said to owe its origin to Byzantium, but there is evidence to show that the front-view face can be found in Egypt before that period, even on painted pottery, *e.g.*, pl. IX, 6. Another influence should also be taken into account, and that is Persia, though it is the Persia of Chosroes, not of Darius.

In the fragments of two little bowls (pl. I, 7, 8) the ware is very finely levigated and is pale pink in colour. The thinness of the walls of the bowls is remarkable, being a little over 1 mm. thick. The figures are painted directly on the pottery in dark purple, probably manganese; the belts and necklaces are white, the long streaks and cloudy washes are in bright red. The style carries on the canons of art of pharaonic Egypt—profile face and legs with front-view





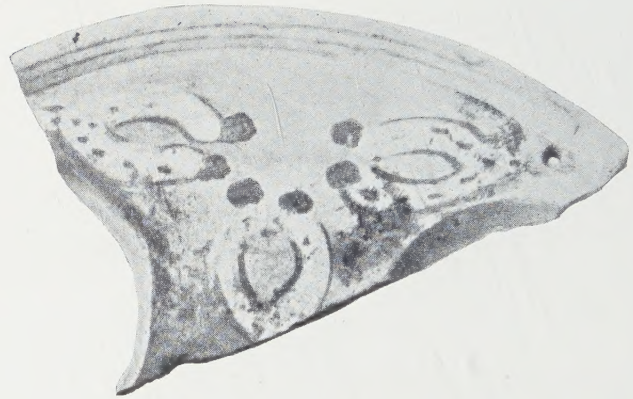


PLATE IV.

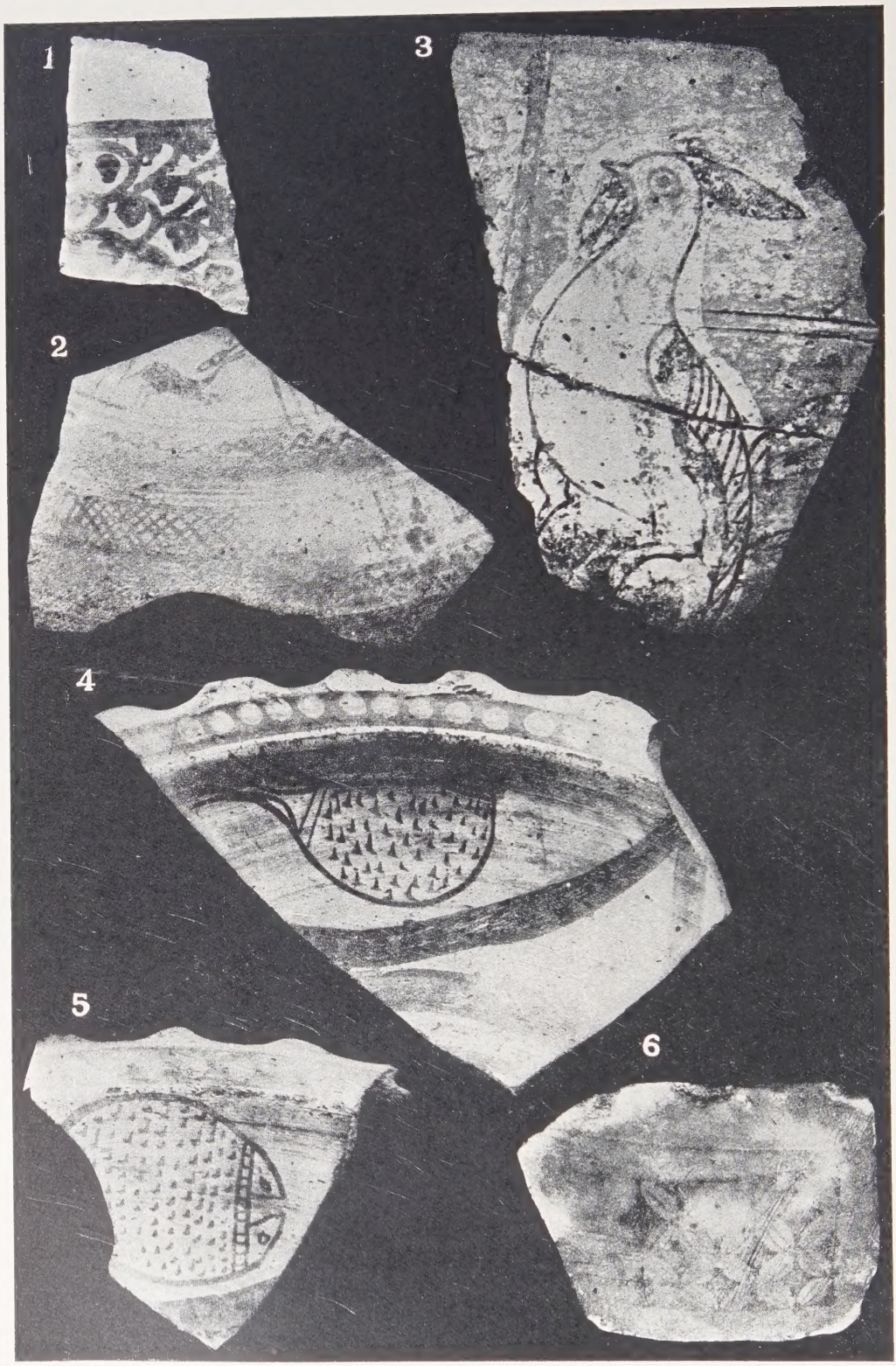


PLATE V.

body—but the fat rounded limbs, large heads and long chins are un-Egyptian. Both pottery and figures suggest a foreign origin.

Figure-vases are rare in historic Egypt and are often foreign when they occur; in Coptic times they are equally rare. The example shown in pl. IV, 3, is one of the few known. It is of a dark reddish-buff ware with decorations in dark brown (perhaps manganese). It appears to represent a cock, but the beak is unfortunately broken.

Though figure vases are uncommon, animal and bird *motifs* are not infrequent. The running animal occurs twice among these fragments. One vase (pl. V, 2) is 6 mm. thick, the ware is fine and well fired and is pale red in colour. The whole surface has been washed with white, now a pale drab. The design is in panels, in one of which is a running antelope painted in solid black. The decorative lines and the network are also in black, and above the network is a band of red. The other running animal is shown on pl. VIII, 4; it also appears to be an antelope.

The fragment (pl. V, 3) is from the upper part of a vase of coarse red ware with a black core, 8 mm. thick. The surface is covered with a wash of white, which was laid on thickly over a larger space than is covered by the design so that it forms a kind of border to the bird. The design may have been in panels, of which only one vertical line remains. The outlines are in black, the comb and wattles of the bird are red, and there is a patch of red on the wing; the tail feathers are alternately red and green, and there is a small patch of green on the indeterminate object on the left.

Another bird decoration is seen in pl. IX, 7. This fragment is part of the shoulder and neck of a vase. The ware is red, 7 mm. thick. The ground is covered with a wash of white, the decoration being in dark purple. Both design and painting are extremely crude.

A fragment of coarse red ware (pl. IV, 2) is covered with a bright yellow wash. The decoration consists of a large bird, of which the head is unfortunately lost. The outlines are in black. The feathering of the bird's wing is indicated by a series of ovals, and the plumage of the breast and tail by rows of short lines. Below the feet of the bird are two lines of roughly made zigzags, and near the tail is a crooked spiral.

The cylindrical vase (pls. VI, 3; IX, 8) is of a fine pinkish ware, 3 mm. thick. It was covered with a wash of white, now drab; the decoration is divided into horizontal bands and is carried out in black with a few patches in red.

Pl. V, 4, 5, are parts of a large shallow bowl. The ware is fairly fine, black in colour. The thickness varies slightly, the average being 9 mm. The surface was covered with a red slip and then washed over with a cream-coloured wash. The design was carried out in the peculiar purplish-brown of manganese. Along the rim is a wide band of colour on which large circular spots are painted in white. Within the hollow of the bowl wide bands of colour are displayed festoon-wise all round; and within each loop of the festoon is the figure of some living creature, a bird (no. 4) or a fish (no. 5). The figures are in outline, the details being expressed in lines and dots.

Pl. IX, 9 is a fragment of rough red ware, with black core; the thickness varies from 5 to 8 mm. The surface is covered with a wash of bright yellow. The fish is painted in red with outlines and details in black. Above and below the fish is a band of red.

There are a few floral designs. The plate seen in pls. VI, 1; VIII, 1, has a diameter of 32 cm.; the ware is fine, and colour a pale red. The surface is covered

PLATE VI.

with a bright red slip. The flower, which somewhat resembles a teasel, is painted white with details in black; the plant is outlined in black and enclosed in a ring of white.

The fragment of an unusually large vessel (pl. V, 1) is of a coarse red ware, 10 mm. thick, with a black core. The design is carried out in brown with irregular spots of red, perhaps representing stalks and flowers.

The base of a large bowl (pl. VIII, 3) has a ring stand 23 cm. in diameter. It is made of a fine reddish ware, the thickness of the bowl being 6 mm. As usual, the surface is covered with a wash of white on which the design is painted. The design, in red, is of fruit or flowers, with outlines and details in dark blue or bluish-black.

The fragment shown in pl. VIII, 8, is of a fine reddish ware fired very hard; thickness 5 mm. This ware is reminiscent of some of the pottery of the late pharaonic period, and the design carries on a lotus-*motif* common in ancient Egypt during the New Kingdom. The surface is washed over with a buff wash as a ground colour; the design is developed in the purplish-brown of manganese with occasional patches of red. The wide bands below the lotus border have a foundation of red under the manganese.

There are several designs which do not come under the heads given above. In pl. IV, nos. 4 and 5 are made of the same kind of ware though they do not belong to the same vessel. The ware is very fine and well fired, and of an even light colour throughout. No. 4 is the centre part of a shallow bowl and is decorated with a circular patch of white, over which a wheel-like object of eight points radiates from a central spot. The spot is black, the thick lines of the "spokes" of the wheel red, the thin lines pale brown; the spots at the tip of the spokes are black. The whole design is enclosed by a fine line of black, then by a wavy line with spots of black. Outside these again are two lines of black, just visible in the photograph.

No. 5 is the rim of a shallow bowl or deep platter. The design is painted directly on the pottery, and consists of three horseshoe-shaped objects in white, outlined in black and decorated with small black spots. At the ends of each horseshoe are two large black spots, which together form an incomplete circle. Large black spots are painted at fairly regular intervals along the rim. The drilled hole on the right shows that the vessel was broken and mended anciently.

Pl. V, 6, is a large sherd which has clearly been re-used, as the edges are smoothed and bevelled with much rubbing. The ware is fine, of a dull greyish drab; thickness 10 mm. The geometric design consists of intersecting circles in black, the interspaces being coloured red. The circles have been drawn by hand without any mechanical means, and are irregular in consequence. The fact that the decoration is contained within a rectangle and is not continuous shows that this is an artist's pattern-piece, and was not intended as the decoration of a vase.

Pl. IV, 1, shows a fragment of the rim of a large vessel. The ware is dark red, the decoration black. The design is in panels, each panel containing an equal-armed cross. The arms of the crosses are ornamented with diagonal lines and dots, and in the centre there is a large dot enclosed with a ring of small circles. The jar was certainly for church use, perhaps for storing the sacramental wine which, even at the present day, is often made in the church.

Pl. II, 3, is part of an elaborately decorated vase. The ware is extremely

PLATE VII.

PLATE VIII.

coarse, as can be seen in the photograph; and, as in all such ware, the core is black, only the outer part being fired sufficiently to turn red. The ground is covered with a wash of dark bright red; the wide bands, quatrefoil and wavy line are painted in light yellow; the outlines, guilloche border, and other details are in black.

A sherd from a large vessel is shown in pl. VIII, 7. The ware is excessively coarse, 15 mm. thick, with a black core. The surface is covered with a wash

PLATE IX.

of white, over which are roughly painted wide zigzag lines in black and irregular spots in red. At the left is a small spiral in black.

A special kind of ware appears to have been used chiefly for ecclesiastical purposes (pl. VII). This is a hard white pottery, wheel-made, the clay finely levigated. The handles and spouts are rather clumsily put on, and the junction of the spout with the body of the vase is masked with a wide line of black. In all examples of this kind of ware the decoration is in black or a very dark brown, probably black originally. The date of these vases is probably mediaeval. All the following examples are made in this ware.

Pl. VII, 1. The base has a line of black; the spout and the circular ornament below it are also black. The neck is ribbed and there is no trace of handles. The circular decoration consists of an outer wavy line which appears to issue from the black circle at the base of the spout; it continues spirally as the inner wavy line. The area enclosed by the two wavy lines is filled with an equal-armed cross surrounded with semi-circles based on the inner wavy line, each semi-circle having a large black dot in the centre. The wavy line probably represents water, especially as it issues from the spout; the connection of water and the cross suggests that the vessel was intended to hold the baptismal waters.

Pl. VII, 2. This vase has been already described on p. 2 among the human representations. It seems to have been for some secular use, but it is of the same ware as the others in the same plate. The painted decoration is in black.

Pl. VII, 3, 4 (see also pl. X, 3). Two views of a one-handled vessel. The design on a similar, but two-handled, vase is shown in pl. VIII, 2. The designs, though obviously intended to be alike, vary somewhat in detail. In both, the connection of the cross with water suggests the use of the vessel for holding the water for baptism. The rest of the decoration appears to be a decadent floral design, though a theological *motif* might be indicated in the pear-shaped object in the lowest part of the design which "proceeds" from the two circular objects above.

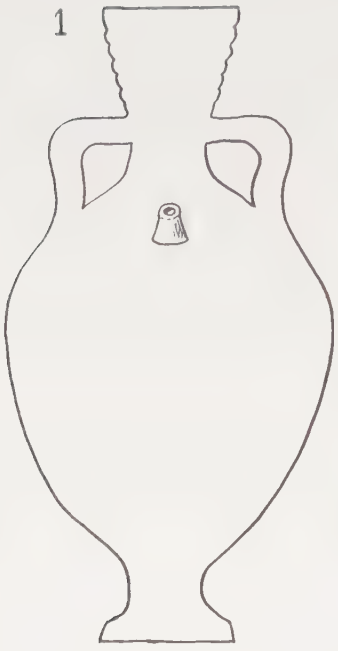
Pl. VII, 5 (see also pl. X, 4). The "handkerchief" form of design is common in Coptic work of the Xth century and later. The design is always square, hence the name which I have applied to it. In this example the central portion consists of a circle in the middle joined crosswise to four circles which form the corners of the square. It is possible that the five circles typify the Five Wounds. The circles in the corners are joined to one another by straight lines, the intervening spaces being filled with loops. The whole is enclosed by two lines which are connected at the corners by small circles. Decorated squares enclosing writings are a common feature of Coptic inscriptions in the temple at Abydos.

A fragment of a similar vessel is shown in pl. II, 1. The decoration is circular. An equal-armed cross forms the centre of a circle, the spaces between the arms being filled with small crosses. The four enclosing lines are alternately plain and wavy.

The fragment of a large vessel (pls. VI, 2; VIII, 9) has an unusual design of stylised date-palms. The bunches of fruit are conventionalised into flowers, and the characteristic roughness of the stem is indicated by lines. An interesting point in the representation is that the trees are shown as growing in a circular hollow or cup in the earth as in the hieroglyph of a tree in the pharaonic periods.

The jug (pl. VIII, 5) is the only specimen of its kind. The decoration

1

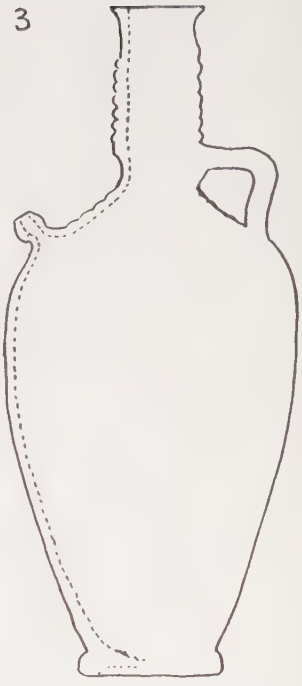


Fine white ware
spout put on separately

2

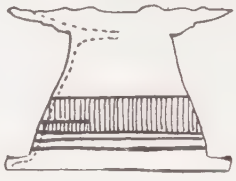
Fine white ware
decoration in brown

3



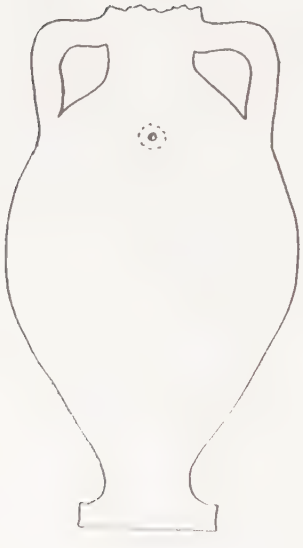
Fine white ware
painted in black

5



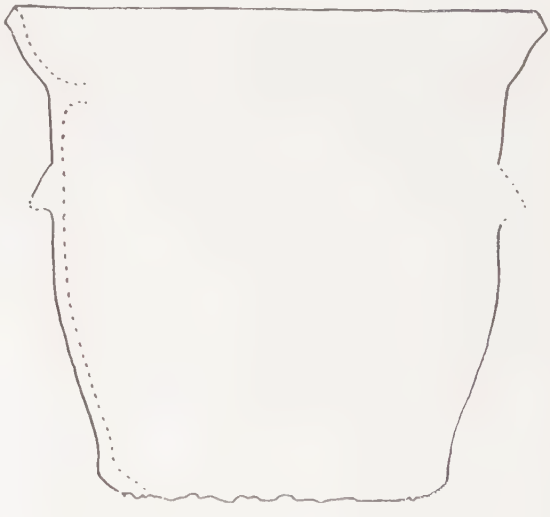
red ware
decoration in red
and black

4



Fine white ware
spout put on separately

6



coarse red ware, black core
design in black on white ground

PLATE X.

consists of the end-piece of a strip of conjoined circles with a dot in the middle of each. Above is a wavy line.

Painted pottery, except for the short period of Tell el Amarna, is so rare in pharaonic Egypt as to be considered worthy of notice when found. Consequently it is allowable to regard such decorated ware as being due to foreign influence or importation during the course of Egyptian history. But painted pottery is not uncommon in Coptic times, as the number and variety of pieces here published must show. So great a change in the decoration of common objects indicates some change in civilization, which in this instance may well have originated elsewhere. The designs also suggest foreign influence. Dots and spots are a noticeable element in Coptic work, but in pharaonic Egypt a spot design is never indigenous, it is always the mark of a foreign origin. The guilloche (pl. II, 3) also is not found in ancient Egypt; purple paint in cross-line patterns (pl. IX, 7) suggests European work; the teasel-like plant (pl. VIII, 1) is not Egyptian. The many foreign elements shown in the paintings on pottery of the Coptic period suggest that this is not an indigenous art, but was brought in from some foreign source. The tracing of its origins might be a fruitful field of study.

M. A. Murray.

RECENT DISCOVERIES IN SYRIA AND SINAI.

SEASON 1934–35.

The work of the British School of Egyptian Archaeology at Gaza in the last few years had pointed strongly to North Syria as the source or channel of large painted vases, and gold-work of granulated workmanship. A search over that

Fig. 1.—Peasants at Tell Termos, Syria.

region was most desirable. In a motor omnibus, bought second-hand in Jerusalem, and furnished with foodstores and blankets, water cans for daily supply, and tents for Mr. J. C. Ellis and our chauffeur, we covered 1,200 miles in Syria during seven weeks, from October to December. We daily searched *tells* near the coast, observing the dates of potsherds. From Tyre up to beyond Antioch the coast region is rich in *tells*, mostly of the Bronze Age. The main group is in the plain of the Eleutheros. This river is the boundary of the Libanese State in which excavation is practically prohibited by Syrian rule; across the river to the north is the Alawīt State, where researches are allowed.

In the Eleutheros plain is a population closely approximating to the old Amorite type. The tall head, long face, and aquiline nose are still to be seen, and with great vivacity and bright expression. Here was the stock which charmed the Egyptians, and which so greatly modified the Egyptian type during the XVIIIth dynasty. In the hills north of the plain, an admixture of types is seen (fig. 1). An ethnographical survey is greatly needed to trace the present boundaries of the many varieties of facial type and dress in Syria.

FIG. 2.—MOUTH OF HARBOUR AT JUBAYL (GUBLA).

The best-known place mentioned in the Tell el-Amarna letters is Gubla, the last refuge of Ribaddi, the Egyptian viceroy. It is still called Jebayl. Though there is a considerable town, happily none of it encroaches on the little port which remains as it was known of old (fig. 2). It is a semi-circular basin, about 250 ft. wide, with sandy beach, limited on the straight side by two reefs of rock, leaving a clear entrance of 140 ft. Shipbuilding still goes on, as of old.

A strange survival of the past is found at Bedawiyeh near Tripoli. Here there is a circular tank of sacred fish, where lively shoals are continually fed by the public. It adjoins a derwīsh mosque, and a similar conjunction is to be found at Urfa—ancient Edessa—in North Syria. There are remaining traces of the popular worship of Atergatis or Derketo, the fish-goddess.

The city of Yarimuta, later Ramitha, was renamed Laodicea and is now Latakiyeh. Though it is a fine site, there seems to be no early pottery. From there, crossing the mountains, we reached Antioch, which is of Greek foundation. Thence the mouth of the Orontes was visited, where there are remains of earlier civilisations.

Early in the spring, I turned to another enterprise which might throw light on ancient Gaza. Along the coast track from Gaza into Egypt, a place of importance lies a few miles west of the frontier at Rafa. There, three *tells* were known, and marked on the Palestine Exploration map. The position, between Rafa and Rhinocolura—now El Arish—fixes the ancient name as Anthedon. That name gives the impress of its ancient character as "the flower of delights", and Tell Jeneyn signifies "the hill of gardens." Alas! all is now a wilderness of high sand dunes, and it proved a most awkward place for access or for work. No car could reach it, unless equipped with the widest aero tyres. On the west, El Arish is twenty miles away, and eastward Rafa, nearly ten miles. Stores were distant, water and bread supplies precarious. The mud village of Sheykh Zowaiyid boasts a police post of two rooms, and one of these with tents served as a starting point. We put up some small huts also.

The three *tells* on the map are all Hellenistic and Roman on the surface. At Tell esh Sheykh on the coast there are wide suburbs spreading half-a-mile, and at Tell Aheimer another large suburb. Tell Jeneyn, wrongly read as Ekneyin on the map, lies so hemmed round by dunes that the extent of it cannot be seen.

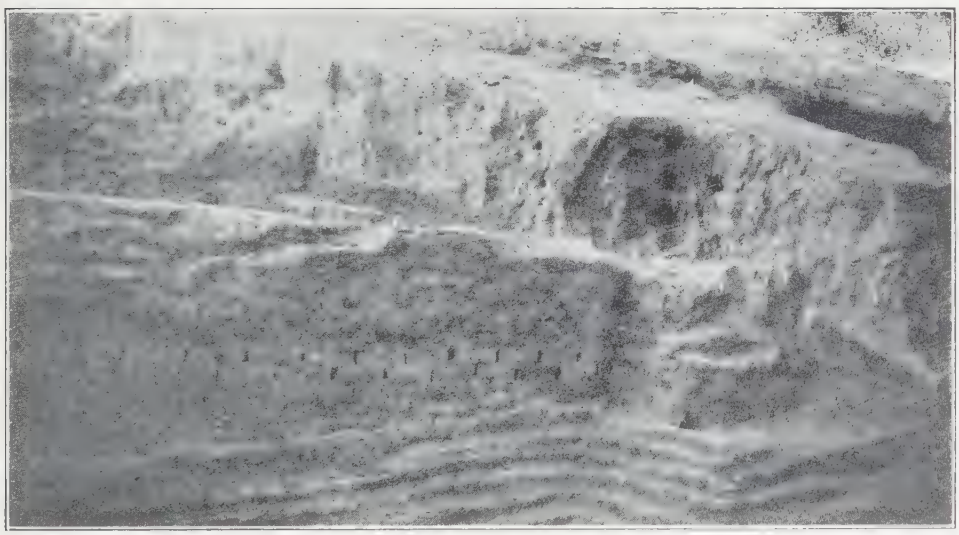


FIG. 3.—SHEYKH ZOWAIYID: WALL OF SHISHAK ABOVE EARLIER WALL WITH STEPPED BRICK APRON.

Close to Sheykh Zowaiyid a *tell*, about 400 ft. wide, is half buried by a ridge of sand dunes across the middle of it. Lines of brick fortification walls were visible, and as our first object was to see whether the site was early enough to be worth working, we began by digging down the outer side which lay exposed. At the corner of a building, the second from the top, the brick walling soon gave us a datum. A jar of characteristic XXIInd dynasty form stood enclosed in the wall, and with it lay a stone corn-rubber, making the provision of drink and food for a foundation deposit, like that in the wall at Gerar.

Next below the XXIInd dynasty wall of Shishak is a massive wall with a remarkable apron of brickwork over its front, descending in nine steps (fig. 3). Below, this is another wall, and yet lower a wall of yellow clay bricks, nearly demolished, with débris stamped down to form a floor. On piercing

FIG. 4.—WORK IN PROGRESS AT ANTHEDON (SHEYKH ZOWAIYID).

through this, we entered a mass of black earth settlement, the walls of which have not yet been reached. These several periods of construction earlier than the XXIInd dynasty may well reach almost as early as the first palace of ancient Gaza. The dating has not yet been verified, however, as living conditions obliged us to postpone further work for the present. A long heat wave over Palestine and Sinai reached 109° in our huts and 120° in the tents. With the shade temperature at 117°, it was getting too late to live among heated sands, and we must look forward to working down and entering the town levels on return to Sheykh Zowaiyid in the near future, when it will be possible to disentangle the history of the site. Enough was excavated to prove that the Greek city of Anthedon continued the older civilisations of a city of 900 B.C. (fig. 4), and others of four or more earlier periods.

Last autumn the usual appeal for support was not issued till there should be a definite programme. Now that prospects are opening out it is hoped that the contributions in arrears may be forthcoming, addressed either to University College, Gower Street, W.C.1, or to Beaumont House, Jerusalem, and that new donations will be a timely aid to further researches.

FLINDERS PETRIE.

NOTES ON GLAZED STONES.

Part II.—Glazed Quartz.

The glazing of quartz, with which are included milky quartz, quartzite and chert, is a difficult process since great care has to be taken to prevent flawing the quartz base. It was practised in Egypt during the Predynastic period and continued in use until at least the XIIth dynasty; scarabs of glazed milky quartz were made in the XIIIth dynasty. After that specimens are rare. Petrie, however, mentions a Hathor head of the XIXth dynasty. A few rather rough quartz beads with patches of blue on them are occasionally found which are identical in appearance with beads from Syria (Pl. I, 5). These beads, although not accurately dated, are said to be found with beads of the Greek or Roman period.

In Mesopotamia glazed quartz beads, which are now nearly always colourless, are found at very different dates. There are two main varieties, called the *high polish* and the *frosted*, on account of their surface at the present time. Some from Ur are supposed to date from before 3500 B.C., whilst others which are practically identical are dated to 900 B.C. These beads are not uncommon at Ur and it should be possible to settle their date. Some of a disc variety (Pl. II, 9) found in Mesopotamia also occur in a Vth dynasty necklace from Egypt, now in the Fitzwilliam Museum at Cambridge; whilst there are others of the same type, and also of another Mesopotamian type, in a string of beads in my collection, many of which are predynastic. Another specimen dated to the Old Kingdom has recently been found at Armant (1932).

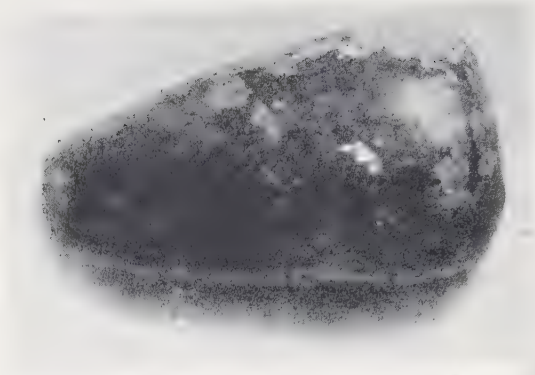
Small glazed quartz shields are found at Ur (Pl. II, 6) which can definitely be dated to 2300 B.C. The technique of these is the same as that of the beads.

Glazed quartz beads are also found in Persia and Syria. Some appear to be very early. A seal of the high polish type (Pl. IV, 24), although obtained at Kadhimain, is probably Persian as it is the same shape, with the same design, as the early seals from Nihavand and Susa; it presumably dates to the third millenium B.C. Although some of the beads from Persia appear to be very early, others seem comparatively recent, and in one case suggest a mediaeval date.

Dr. Ernest Mackay tells me he has found three glazed quartz beads of the high polish variety at Mohenjo-daro. One of these is an oblate bead, another a short convex bicone, whilst the third is a lenticular cylinder, that is, a bead in which the transverse section is that of a double convex or lenticular bead, whilst the longitudinal section is that of a cylinder (fig. 1). The shape of this last bead is important, for although beads of this shape are found at the Indus Civilization site, Mohenjo-daro, they are not at present reported from Mesopotamia or Egypt. This might point to their being of local manufacture; but if that

Fig. 1.

Fig. 2.



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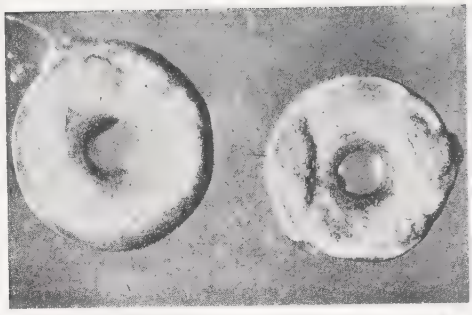

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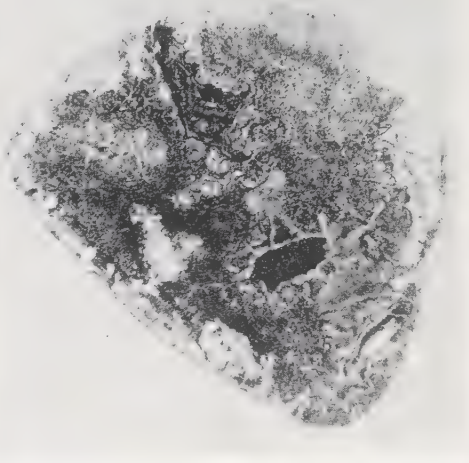
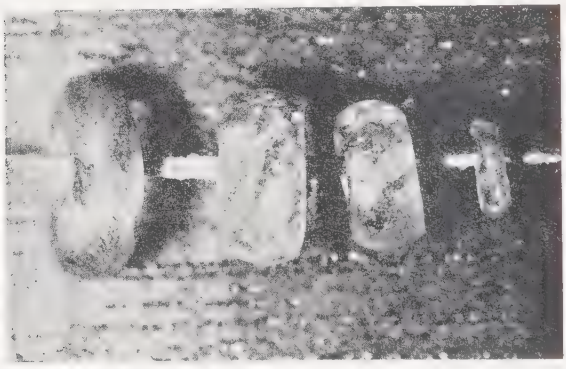
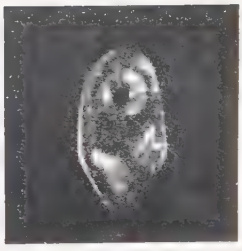


2a × 20



3 × 3



4 × 3

5 3

5a × 50

PLATE I.

be so it is surprising that only three have been found at Mohenjo-daro and that none have been reported from Harappa. I am therefore inclined to think that as somewhat similar beads, though lenticular barrels (fig. 2) in shape, have been found in Mesopotamia, these Indus specimens must have been imported from Sumer. If this be so, as the Indus specimens are dated to about 2750 B.C. the probability is that some of those from Mesopotamia are of the same date.

A number of fine glazed quartz specimens from Northern India are dated to the 1st century A.D.; but there are also one or two specimens from the same site which suggest a much earlier date, and they also may have been imported from Mesopotamia. I do not know of any specimens from Europe, and even in Egypt and Asia they are rare. The process does not seem to be carried on at the present day.

Quite large specimens of glazed quartz are sometimes found. One of the finest is a Predynastic glazed quartzite mace head (Pl. I, 1). This is about two and a half inches long, and although the glaze has now broken away from half the surface the remainder is sufficient to show that it was originally coloured all over. A still larger specimen is a boat discovered by Sir Flinders Petrie. This is in several pieces that were originally joined together by wires, and it must have been nearly two feet long. Very little glaze now remains. In the British Museum is a large fragment of glazed quartzite which appears to be part of a tile. Some of the small drop-pendants of the First Intermediate period in Egypt are amongst the most beautiful specimens as regards colour, but many of them show great unevenness in the thickness of the glaze (Pl. I, 4).

With the exception of the drop-pendants the great majority of specimens of glazed quartz from Egypt are beads. In Mesopotamia the specimens are confined to beads, drop-pendants and the little shields for inlay already mentioned. In Persia also the specimens are either drop-pendants or beads, but some of the beads are panel beads of considerable size and great elaboration. An exception, probably from Persia, is the glazed quartz seal described above (Pl. IV, 24). In India, however, there are a number of small but elaborately worked pendants representing animals, such as lions. These date to about the Christian era.

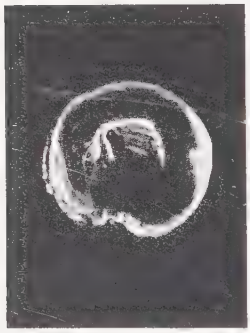
All these specimens have been "glazed"; that is to say, they had had the surface coated with some material and then been heated until it melted. The method by which this was done seems to have varied in different specimens and places. All the specimens from Egypt, except a few which I believe to have been imported, appear to have had an already made glaze or else the ingredients to make a glaze powdered up and applied to the surface, and then to have been fused. Some of the specimens from Mesopotamia appear to have been treated in the same way, but there are a number from that country and Persia which were glazed by a different method. To these an alkali only was applied instead of a glaze; they were then heated until the alkali fluxed the surface by combining with the silica of the bead and flowed over the surface. These beads have an extremely *high polish* which was at first attributed to sand polish, but a careful examination soon proved that this was not the case.

Another variety of quartz bead found in Mesopotamia is the *frosted* quartz bead. This has the surface completely covered with small conchoidal fractures, and generally only slight signs of having been glazed. A careful examination, however, convinces me that this also is a variety of glazed quartz. It was produced by a combination of the Egyptian and the "high polish" techniques These techniques are decribed later.

6 ×3

7 ×3

7a ×8

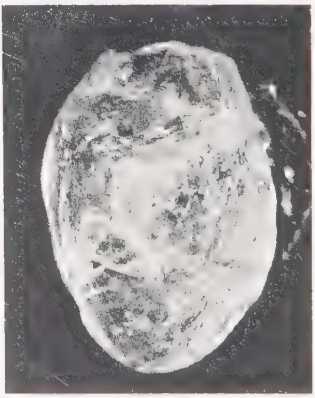


8 ×3

8a ×62

9 ×3

10 15



11 ×3

12 ×3

PLATE II.

After examining a large number of specimens, I have selected 28 for illustration which are either typical or show some special feature; four from Egypt, one from Syria, sixteen from Ur, two from Nineveh, and five from Persia.

The numbers in the list of these specimens on pp. 29 ff. correspond with the numbers of the illustrations. If there are two illustrations of the same specimen they are numbered 2, 2a.

As already stated, the Egyptian beads appear to have had a glaze added which had been previously made and coloured. To ascertain what materials were used for this glaze, I consulted Sir Herbert Jackson, K.B.E., who very kindly made some experiments for me. One experiment was to test the glaze on a Predynastic Egyptian glazed chert bead (Pl. I, 2). This bead had a very heavy glaze which had run into lumps or drops, and had picked up a fragment of stone from the bottom of the furnace. The glaze was a typical bright blue, except in the lumps where it was almost black. As on most Egyptian specimens, the glaze had broken away over a considerable part of the surface.

Sir Herbert Jackson says: "I have examined spectroscopically the bead to which you have referred on several occasions, viz., the one labelled Egyptian glazed quartzite bead, the glaze being of a blue-green colour. The evidence for copper is definitive and conclusive. The amount of sodium present is very much more than is to be found in any specimen of crystalline quartz. The amount of calcium present is merely a trace and in most specimens of quartz that I have examined I have seen about the same amount of calcium. We may take it, therefore, that the glaze contains, in addition to the silica from the quartz, copper and sodium." This seems conclusive evidence that in this type a sodium glaze coloured with copper was used, in fact an ordinary blue copper glass.

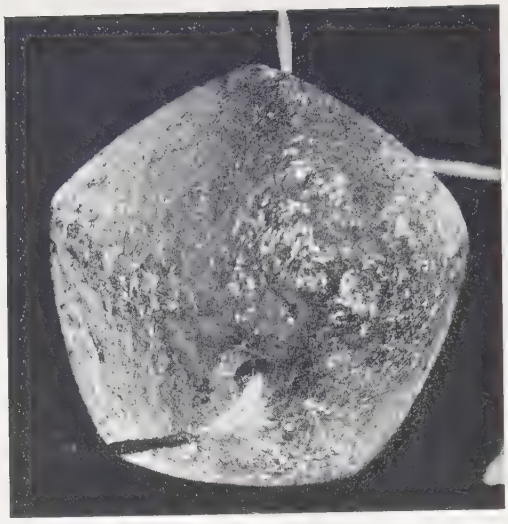
Pl. I, 2a, shows a section through this bead; the glaze appears as a thick layer round the chert, varying in thickness in different parts. Examination by polarized light shows that this layer is isotropic and that it is therefore a glass.

The next experiment was to find out what flux had been used to make the glaze of the *high polish* beads flow over the surface. I sent Sir Herbert Jackson a portion of a bead exactly like no. 8 in Pl. II, which seemed a quite typical specimen of the high polish variety from Ur. A casual look at beads of this sort suggests that they were ground and polished in the ordinary way by friction, but a close examination at once shows that the surface has been in flow. This is clearly shown in Pl. II, 7, and is also seen in some of the others illustrated.

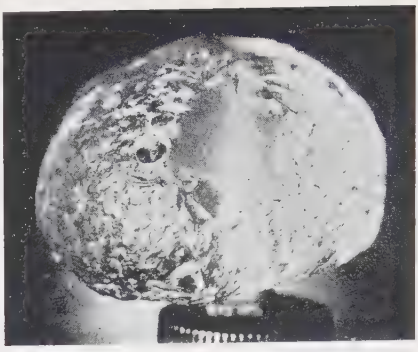
As the base of Egyptian faience consists of quartz grains fused together with a little lime, I asked Sir Herbert Jackson whilst testing the specimen to look out specially for calcium.

He replied: "There is no evidence of calcium in the quartz. In fact there is less calcium in that piece of quartz than in two or three other pieces of quartz which we examined at the same time. None of the other pieces of quartz, however, showed anything like the enhanced brilliancy of the sodium lines as seen from your piece of quartz bead.

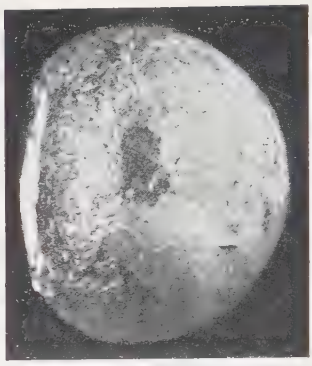
"There is no doubt in my mind that that piece of quartz contains a marked amount of sodium, and that the sodium is probably mostly on the surface, since the brilliancy of the sodium lines is at its greatest when the electric arc is first struck, and fades away to such an extent that, when the fused globule has become rather less than half it was when first fused, the sodium lines do not differ greatly in brilliancy from those seen in samples of, *e.g.*, Madagascar quartz. I am



13 ×3



14 ×3



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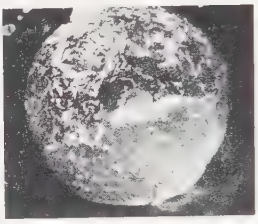

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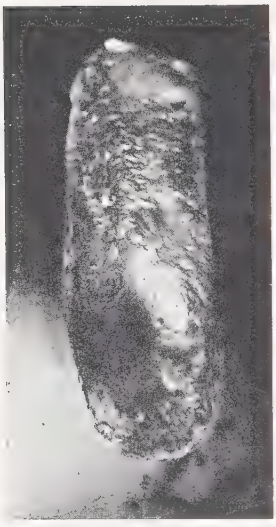


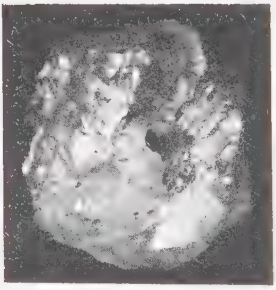
15 ×3

18 ×3

18a ×62

20 ×3

19 ×3



21 ×3

PLATE III.

aware that the argument for glazing with some sodium compound is not impregnable, but the evidence about absence of calcium in sufficient quantities to produce a glaze is definite, and the evidence in favour of any glaze effect being produced by sodium is more than presumptive."

This settled the alkali used in two varieties, so I then sent Sir Herbert Jackson one of the *frosted* variety from Ur. In this case also he found considerable traces of soda in the surface of the quartz. From these results it seems probable that a soda glaze was always used for this purpose.

Owing to the fewness of the specimens of Egyptian glazed quartz that I have been able to examine, and the almost complete absence of unfinished ones, I cannot say with certainty how they were made, but I think they were first ground to shape, then perforated, then glazed. An exception, in a necklace from Abydos, is some glazed quartz pendants which had not been perforated but had had loops fused on to them, rather like the tooth beads from Nineveh referred to later.

A typical example of the Egyptian glazed quartz bead is shown in Pl. I, 3, where a slight magnification shows the beads to be covered with a vitreous layer. This, however, is much thinner than in Pl. I, 2, and as the base is transparent crystal it gives a very beautiful pale colour.

The glazed quartz pendant (Pl. I, 4) is also a very typical Egyptian example. In this case the glaze has a crackle effect all over, showing that the coefficient of expansion of the glaze is different from that of the quartz. This tends to make the glaze flake away and accounts for the fact that in so many specimens the glaze has entirely disappeared. From this pendant pieces have flaked off, but not to the complete depth of the glaze. In these specimens the surface left on the quartz is quite distinctive ; it is polished, but not nearly so highly as on the Mesopotamian high polish specimens.

The Mesopotamian beads give us evidence of a more complicated process. These beads, whether of the high polish or frosted variety, appear to have been first ground to shape and then to have had the surface hammered so as to cover it with conchoidal fractures. After this it seems frequently to have been necessary to touch up a few parts by grinding. The bead was then perforated, and finally glazed. This I have discovered by the examination of a number of specimens, several of which are unfinished.

The difference between the *high polish* and the *frosted* beads seems to have been only that, whereas the latter had a completed glaze powdered and applied to them, the former had an alkali only added which formed the glaze by combining with the quartz of the bead. The object of frosting the surface seems to have been to give a greater surface for the alkali or glaze to work on. In the case where an alkali only had been added, this seems to have attached itself so firmly that it never flakes off, whereas in the cases where a glaze had been added, it seems to have flowed at a temperature too low to attach itself properly and has generally almost entirely disappeared.

The high polish specimens were at first said to be sand-polished ; but when they are carefully examined one can see that many of the little shields have had pieces at the ends evidently ground off after glazing so as to make the shields fit into the pattern of the inlay. As these parts are in some cases the most prominent, it is obvious that they could not have been left unpolished if the remainder had been polished by sand.

I have several reasons for saying that beads were ground before frosting.

One is that the shape of some of the larger ones is so accurate that I do not think they could have been made by simply chipping them down. This especially applies to beads such as no. 13 in Pl. III, a pentagonal circular bead. What is perhaps a more definite proof is shown by the bead no. 14 in the same plate and the pendant no. 15, both unfinished, on which series of conchoidal fractures are seen merging into the edge of a ground patch. Some of the fractures have not yet broken away from the grey surface, which is on a slightly higher level than the frosted portion.

It has been suggested that the grey patches remaining on these beads are part of the original surface of water-worn pebbles. In some cases this might be possible, but in others it is quite impossible.

That the surface has been in flow is shown on most of the high polish specimens. In some cases, as in Pl. I, 5a, the flow has not covered a grey patch and can be seen on the edge of it like a wave.

The fact that the frosting was done before glazing, and has not been caused by the breaking away of the glaze due to contraction, is shown in Pl. II, 10, where the glaze has not flowed over a small patch in which there is a conchoidal fracture that could not have been made after the glaze was there. Also, in some of the Mesopotamian and Persian high polish specimens the remains of conchoidal fractures can be seen covering a large portion of the bead, but completely under the glaze, *e.g.*, in Pl. II, 11, and round the edge of Pl. IV, 24.

The fact that the perforation was done after frosting is shown by the number of specimens found which are frosted and not perforated, also by the beads which were broken during perforation. In no. 17 in Pl. III, the perforation had just been started and the bead then discarded, probably on account of a large chip on the surface where the perforation would have come out.

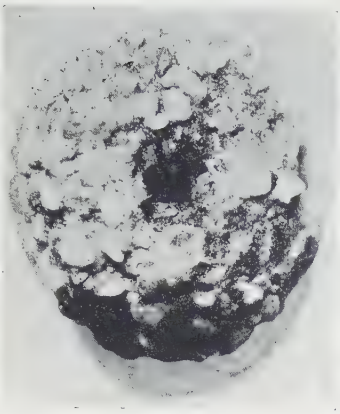
The perforation was done with a hollow rotating drill. Another curious feature is that it was generally drilled straight through from one end, with the result that there is often a large chip where it broke through at the second surface. The pendant, no. 15 in Pl. III, is exceptional in that the perforation was started from both sides; the pendant apparently broke just when the two perforations were meeting. In this case, although a rotary drill was used it is not possible to say if it was hollow.

Amongst the unfinished beads which do not seem to have been glazed the surface is mostly frosted, with only a few small grey patches. A good many of the finished specimens, however, have small grey patches which are not covered over with glaze, but only one has a patch of frosted surface not covered (Pl. II, 10). This suggests that the alkali when put on alone flows more easily on the conchoidal fractures, which probably explains why the frosting was done.

If the high polish beads took an alkali into their surface, it must have had the effect of turning the surface into a kind of glass. If this be so, it is very curious that these beads should apparently have complete freedom from corrosion; they seem to corrode no more than natural quartz, whereas glass of that age always shows signs of corrosion and most specimens from Mesopotamia are in a hopeless state of decay.

To see if I could get a further proof of an alteration to the surface of the bead due to an alkali, I cut a section through the same bead that was tested by Sir Herbert Jackson (Pl. II, 8a), and also through a milky quartz specimen (Pl. III, 18a). Although there is no alteration near the surface that can be

22 ×3



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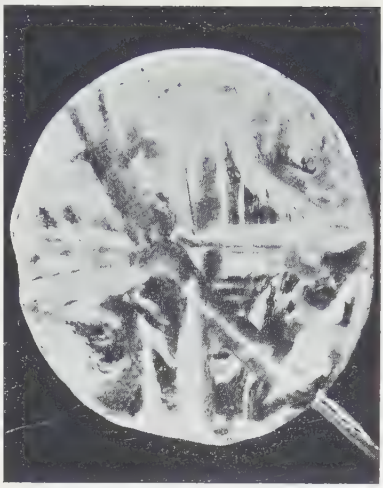
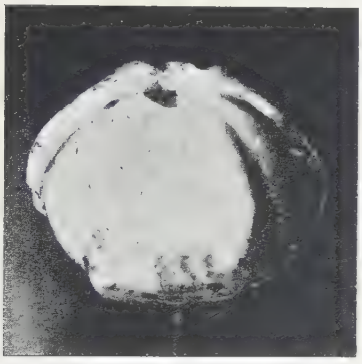
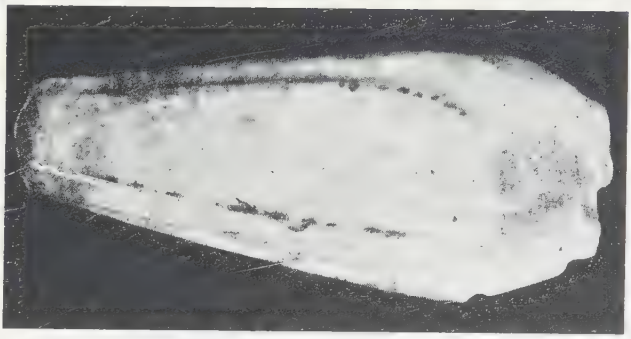


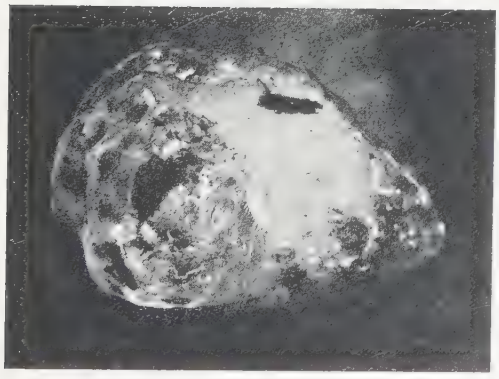
24 ×3



25 ×3



26 ×3



27

28 ×3

PLATE IV.

detected when examined under a microscope in ordinary light, when polarized light is used a distinct difference is noticed. The edge is a different colour. This may be due partly to a bevelled edge or to reflection, but I think it is chiefly due to the soda that had been introduced into the silica. The effect seems to penetrate further in the milky quartz than in the clear quartz specimen.

The frosted beads are so free from glaze that at first I was very doubtful

whether they had been glazed, but an oblate bead (Pl. III, 16) has a large patch of coloured glaze remaining. Close examination has also shown minute pieces of decomposed glaze in some of the crevices.

The Mesopotamian glazed quartz beads are frequently regular in shape; the most typical are the oblate to spherical and the disc forms. There are, however, a few which are absolutely irregular (Pl. III, 21). These appear to be roughly broken pieces of quartz which were perforated and then glazed, as there are remains of corroded glaze in many of the hollows. The surface of these is intermediate between the high polish and the frosted.

Two other Mesopotamian specimens illustrated (Pl. IV, 22, 23) differ somewhat from the others, and may have a different technique. They come from a curious hoard of beads that Dr. Campbell Thompson discovered three years ago, and are supposed to date to as early as 2900 B.C. The tooth bead (Pl. IV, 22) is the most interesting; it is a piece of quartzite roughly chipped to shape and then mounted in a piece of faience so as to represent a tooth. The whole was then fired, and the glaze from the faience seems to have completely covered the quartzite block. The other, Pl. IV, 23, was made in a similar way, but instead of one large block of quartzite a considerable number of smaller ones were inserted. In this case also the glaze covered the pieces of quartzite.

Some of the Persian glazed quartz is very similar to the high polish Mesopotamian, and was probably made in the same way. Nos. 27 and 28 in Pl. IV, which come from Shah-i-Bilqis, are typical of a number of specimens, many of which are dated to at least as early as the third millenium B.C., and probably earlier.

The seal, Pl. IV, 24, is also supposed to be early. Though bought in the market at Kadhimain, it is exactly the same shape and has the same pattern as seals from Nihavand, and is probably Persian.

The panel beads, Pl. IV, 25, 26, are undated. No. 25 was bought with a number of other glazed quartz specimens on a string which is stated to have come from Rhagae. On the same string were a quantity of glass beads, many of which date from the eighth to third centuries B.C. No. 26, bought in Tehran, resembles several on the same string as no. 25; I have also a very badly made specimen from Egypt that was in the Amherst sale. I do not know the date of these specimens, but one of them suggests mediaeval work.

The question as to whether the high polish and frosted specimens of glazed quartz were all coloured is a difficult one. There are certainly remains of colour on quite a number of the high polish beads, and the bead and pendant of milky quartz, Pl. III, 19, 20, were evidently coloured over a considerable portion of the surface. These, although they have a fairly bright surface, are not, however, quite as bright as the majority of the high polish beads, and I think they were made in the same manner as the Egyptian specimens. The colouring matter on no. 20 is very like cobalt, and the way it was applied suggests that it may have been put on as a second process.

Another specimen which has a great deal of colour distributed over it is the bead from Shah-i-Bilqis (Pl. IV, 27). Here part of the glaze, which seems to be cobalt, is a bright deep blue, but other parts have corroded to brown. On the pendant (Pl. IV, 28) from the same site all the remains of glaze are a brown colour. This is important, as it shows that the small brown patches to be seen in the hollows of most of the high polish beads are the remains of a coloured glaze.

The little glazed seal (Pl. IV, 24) from Persia suggests another possibility. The cross grooves are partly filled by a blue glaze which has the appearance of a semi-fused powder, whilst the remainder of the surface has a very high polish. This suggests that the coloured glaze was added after a previous alkali treatment had polished the surface. If this be the case, and the colour had been added as a second process at a much lower temperature, it would explain why in so many cases the colour has completely disappeared.

Several of the high polish beads from Ur show small patches of colour, and a larger number show small brown remains of decomposed coloured glaze.

If, as seems probable, the colour was generally put on as a separate process, it is possible that some of the high polish beads were not coloured; but from the number that have only a slight trace remaining I think it very probable that they were all coloured.

The frosted beads were also in my opinion coloured. The large patch on bead no. 16 in Pl. III makes it quite evident that it was coloured, and minute traces of colour in the conchoidal fractures of a number of specimens point to the same fact. In these beads the colour was probably added as a glaze.

The colour of all the beads referred to above is either blue or green, except where most of the glaze has gone and the few fragments that remain have corroded into a dull brown. There were two varieties of blue glaze used, one a pale blue coloured with copper, the other a much darker blue, sometimes, and probably always, coloured with cobalt.

The tooth beads (Pl. IV, 22) and crumb beads (Pl. IV, 23) from Nineveh show traces of a red glaze. An examination of several tooth beads showed that there is no evidence of conchoidal fractures or of uncovered grey patches. One, however, bears the remains of a blue glaze, and another of a pinky red glaze.

The crumb beads had been heated sufficiently to cause a considerable flow on the surface. Two specimens had portions covered with red glaze, two with blue glaze, and one specimen had remains of both red and blue glazes, of which the blue glaze appeared to be under the red.

Of the faience beads found with them in the bead layer some bear the remains of a very intense red glaze. The colour of this glaze has been proved to be due to copper, and the colour of the red glaze on the pieces of quartz in the tooth and crumb beads is probably due to the same metal.

PLATE I.

EGYPT.

Fig. 1. Glazed quartzite mace head. Predynastic. Photo. No. 43

Half this specimen is covered with a greenish glaze, which originally covered it completely. It is one of the largest pieces known. Ref. No. B/2223 Natural size.

Fig. 2. Glazed chert beads. Predynastic. Photo. No. 119

The glaze, which is very thick, has formed large blobs, one of which has picked up a piece of stone from the floor of the furnace. The colour is a fine blue. Ref. No. B/331 (×3)

Fig. 2a. Section of one of the previous beads. Photo. No. 169

The glaze shows as a thick layer round the stone which has somewhat the consistency of an agate. Under polarized light, the glaze shows as an isotropic material, viz., a true glass. Ref. No. B/331 MS. 452 (×20)

Fig. 3. Glazed quartz beads. Predynastic. Photo. No. 1
Ref. No. B/3
(×3)

These beads are covered with a thin layer of pale blue, vitreous glaze, which has flaked off in places.

Fig. 4. Glazed quartz drop-pendant. First Intermediate. Photo. No. 1
Ref. No. B/15
MS. 630
(×3)

A typical specimen of the glazed pendants of this period. The glaze, which is of a very fine colour, is crackled all over owing to the unequal coefficients of expansion of the glaze and base.

SYRIA.

Fig. 5. Bead of glazed quartz. Aleppo. Photo. No. 1
Ref.No.B/126
(×3)

This bead, of which a large portion is covered with a cobalt blue glaze, is a type which is found both in Egypt and Syria. Although not accurately dated, beads of this type are sometimes associated with beads of the Greek and Roman periods.

Fig. 5a. Fragments of glaze from specimen no. 5. Photo. No. 1
Ref.No.B/126
MS. 45–7
(×50)

PLATE II.

MESOPOTAMIA.

Fig. 6. Glazed quartz shield. Ur. Photo. No. 1
Ref. No. B/15
(×3)

These little shields of the high polish, Mesopotamian glazed quartz were at first thought to be sand-polished. It is evident, however, in many of them that the edges have had little portions ground off to make them fit. This had been done after polishing. In some cases definitely dated to *c.* 2300 B.C.

Fig. 7. High polish glazed quartz pendant. Ur. Photo. No. 1
Ref. No. 2053
MS. 629
(×3)

This little pendant, which has a very high polish, has also a number of small grey patches where the glaze did not flow. The glaze seems to have flowed to a considerable depth; it finishes up on some of the grey spots like a wave, as is shown more clearly in fig. 7a.

Fig. 7a. An enlarged photograph of part of no. 7. Photo. No. 1
Ref.No.B/205
MS. 629
(×8)

It is possible that in this case the frosting process was omitted or only done over a portion of the bead. Although the glaze seems to have flowed to a considerable depth it has not covered several ground patches (grey). These are distributed over various parts of the pendant, but show no signs of conchoidal fractures. Another possible explanation is that in this case the frosted surface had been very extensively touched up by grinding before the bead was glazed.

Fig. 8. Broken specimen of the spherical, high polish type. Ur. Photo. No. 1
Ref.No.B/227
MS. 634
(×3)

It is included here as it is typical and shows the inequality of the surface due to the way in which the glaze had flowed. Although not definitely dated, is thought to be early.

Fig. 8a. Section of the bead that was tested by Sir Herbert Jackson. It shows a change of colour near the edge when examined in polarized light. This is not caused by variation of thickness due to a badly ground surface Photo. No. 1
Ref.No.B/205
MS. 453
(×62)

being rubbed off at the edge ; the wasters used in grinding would prevent this, and also a very great difference would be necessary. Though it may be partly due to fracture of the edge at an angle, I think it is the result of a real difference in the refractive index of the quartz at the edge due to the absorption of the soda. A slight difference could also be seen at the edge of a thinner section.

Fig. 9. Disc-shaped bead of the high polish variety ; one of the commonest forms. Photo. No. 140 Ref.No.B/1557b (×3)

Fig. 10. Fragment of a highly polished, transparent glazed quartz bead. Ur. Photo. No. 176 Ref.No.B/2276a MS. 633 (×15)

It has a patch where the glaze has not run, and in this patch is a portion of a conchoidal fracture which must have been there before the bead was glazed. This shows that the frosted surface must have been made before glazing ; this particular conchoidal fracture could not have been made afterwards.

This question is of some importance, as at first I thought that the frosted surface might have been made by the flaking away of the quartz surface together with the glaze, owing to different coefficients of expansion and changes of temperature over a long period.

Fig. 11. Pendant of high polish type. Ur. Photo. No. 168 Ref.No.B/2275b MS. 636 (×3)

A comparatively large and very transparent pendant showing the conchoidal fractures of the frosted surface only partially melted out, although the surface had flowed considerably.

Fig. 12. Half-bead of transparent glazed quartz. Ur. Photo. No. 132 Ref.No.B/2275a MS. 635 (×3)

This bead appears to have been broken either before or during firing, as the fractured surface is glazed and there is considerable rounding of the broken edge of the perforation. A curious marking over the broken surface may be the result of the firing when it was broken or may be some form of corrosion. Alternatively, this marking may be due to sand-polish.

PLATE III.

Fig. 13. Frosted pentagonal circular bead. Ur. Photo. No. 124 Ref. No. B/2058 (×3)

This is the most perfect form of frosted bead that I have seen. The surfaces are so regular that I do not think it could have been made with such accuracy unless it was ground to shape first. Even then the frosting would require care. Possibly it was done by rumbling with a number of other beads or pebbles.

Fig. 14. Fine specimen of frosted bead. Ur. Photo. No. 116 Ref.No.B/1556b (×3)

A large grey (ground) patch which is not frosted appears to be on a higher level than the frosted part, and in one place a flaw goes under the grey portion, but has not yet broken away. Hence it is evident that the grey surface was made first and the frosting done afterwards.

Fig. 15. Frosted pendant, broken at the perforation. Ur. Photo. No. 141 Ref.No.B/2251b (×3)

This specimen also shows conchoidal fractures breaking into a grey patch. The perforation had been started from both sides with a rotating

drill, but there is no evidence as to whether the drill was hollow. The two holes appear just to have met before the top part was broken off. There is a rounded grey patch on one side. On considering whether the grey patches left on so many of these beads could be the result of leaving part of the natural surface of a pebble, I came to the conclusion that in this case it was extremely improbable, whilst in other cases it was quite impossible.

Fig. 16. Frosted bead with patch of glaze. Ur.

Photo. No. 1
Ref. No. B/22
MS. 647
(×3)

This is the only frosted bead that I have seen with any large patches of glaze remaining. A quite big patch of a rather greenish colour is definite proof that these beads were sometimes glazed; moreover, several others show minute traces of decomposed glaze in the crevices of the conchoidal fractures.

Fig. 17. Frosted bead with unfinished perforation. Ur.

Photo. No.
Ref. No. B/23
MS. 638
(×3)

The perforation had been only just commenced with a tubular drill. A grey patch opposite the perforation may be part of the original surface of a pebble, but it is most improbable. A flaw nearly across the bead from the commencement of the perforation is probably the reason why the bead was discarded unfinished.

The frosting had obviously been done prior to the perforation. Several small frosted balls that have been found without any perforation are probably unfinished beads. The perforation in all cases seems to have been done before glazing.

Fig. 18. Milky quartz bead. Ur.

Photo. No.
Ref. No. B/19
(×3)

Elliptical oblate in form.

Fig. 18a.

Photo. No.
Ref. No. B/11
MS. 456
(×62)

Section of the last specimen to test whether the surface was optically different on account of the soda which had been shown to be there by means of the spectroscope. As expected, the effect could be seen in polarized light; it seems to extend in for a considerably greater distance than in the clear, high polish bead, no. 8a in Pl. II.

Fig. 19. Coloured milky quartz bead. Ur.

Photo. No.
Ref. No. B/20
MS. 642
(×3)

This bead has a large number of patches of coloured glaze remaining on it, and it looks as though the whole surface was originally glazed. The patches that remain are in most cases very broken, and those that look like the original surface of the bead are very crackled. The surface of the colourless portion is slightly grey when examined with a magnification of 250. The surface of most of the beads examined showed this slight greyness, but it was much less in the high polish beads.

Fig. 20. Milky quartz pendant (coloured). Ur.

Photo. No.
Ref. No. B/24
MS. 637
(×3)

The colouring matter of a large number of dark blue patches I believe to be cobalt, though I am not certain. The colour-glaze is very patchy and the bigger pieces have a large number of circular holes right through which are probably due to bubbles. In addition to the large patches, there are a great number of small pieces of blue glaze remaining

in the cracks. This points to a large portion of the surface having been originally coloured, though I am not certain whether the whole surface was, as many of the large pieces of glaze look as if they are now in the same condition as when they were originally fused.

Fig. 21. Irregular quartz bead. Ur. Photo. No. 146 Ref.No.B/1558b (×3)

One of the rough fragments of quartz which had been perforated and apparently glazed. Some specimens are much greyer than this one, and others show signs of conchoidal fractures over a part of the surface. One would be inclined to think them unfinished beads except for the fact that they show definite signs of having been glazed.

PLATE IV.

Fig. 22. Imitation tooth bead. Nineveh. Photo. No. 123 Ref. No. B/2108 (×3)

Apparently an imitation of a molar tooth. A large piece of quartz is mounted in a piece of material similar to Egyptian faience. There is no sign of conchoidal fractures or of uncovered grey patches, and possibly the glaze had run down from the faience top. The perforation is in the faience. This bead is from the so-called "bead layer" at Nineveh, where an immense number of beads were found. As a number of these beads were similar to some of the very early specimens from other sites in Mesopotamia, it is probable that they are not much more recent than 2900 B.C.

An interesting point is that one quartz specimen showed signs of a red glaze. As the red glaze on some of the faience from the same collection of beads was coloured with copper, it is probable that the red glaze on this and no. 23 in the same plate owes its colour to copper.

Fig. 23. Crumb bead. Nineveh. Photo. No. 121 Ref. No. B/2109 (×3)

This bead is very similar to the last save that a number of smaller quartz pieces had been inserted instead of one large one. The use of different colours for glazing is much more marked here. Some specimens are definitely blue, and others red, whilst one has red and blue on the same bead, the blue glaze apparently under the red in some parts. As in no. 22, the firing seems to have been sufficiently hot to cause a good deal of flow on the surface.

Fig. 24. Glazed seal, probably Persian. Bought at Kadhimain, near Baghdad. Photo. No. 122 Ref. No. B/2071 (×3)

In design and shape this seal is similar to seals found at Nihavand and Susa, and it is, I think, probably of Persian origin. The cross on the flat surface is partially filled with a coloured glaze. This looks as though it was applied as a powder and had not completely melted. As the other portions of the surface where there is no colour show signs of a large amount of flow, probably needing great heat, I think that this coloured glaze must have been added as a later process. The rounded edge where the curved and flat surfaces meet show signs of conchoidal fractures not completely melted.

Fig. 25. Oblate sector, panelled bead. Rhagae, Persia. Photo. No. 129 Ref. No. B/114 (×3)

This specimen is almost entirely covered with a bright blue glaze, probably due to copper. There is no evidence as to its date, but it was

bought with a number of glass beads dating to between 800 and 300 B.C.

The method of manufacture is probably the same as in the Egyptian beads.

Fig. 26. Bead with U-shaped panels. Teheran. Photo. No. Microslide (×3)

This bead is of similar technique to the last from Rhagae, and I have also a specimen, very roughly made, from Egypt.

The blue glaze which had been very thick has mostly flaked away. A large number of bubbles on the surface of the quartz show that the whole surface was originally covered with glaze.

Fig. 27. Quartz bead with blue glaze. Shah-i-Bilqis, Persia. Photo. No. Ref. No. B/ (×3)

This is a rough, high polish bead with numerous patches of dark blue. The colouring-matter appears to be cobalt. The coloured glaze is full of air bubbles, and the colourless portion looks as though it originally was covered with a coloured glaze which has flaked off.

Fig. 28. Quartz pendant with corroded remains of coloured glaze. Shah-i-Bilqis, Persia. Photo. No. Ref. No. B/ (×3)

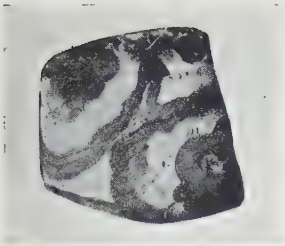
This pendant is from the same string as the last, and they were probably found together. It has a large number of patches of glaze on it, but except for one minute spot the glaze has everywhere corroded to a dull, pale brown colour. This bead and others on the same string, including no. 27 in Pl. IV, which are practically colourless, all show signs of conchoidal fractures or frosting, now partially obliterated. I believe these beads to be of very early date.

Part III.—Carnelian, Agate, and Felspar.

In addition to steatite and quartz, other stones were chemically treated. The most important of these are the etched carnelians, agates, and chalcedonies. These were not actually "glazed," but had a special treatment in which soda was added, though usually as a decoration and only over a small portion of the surface. (See Ernest Mackay, *Decorated Carnelian Beads*, Man, 1933; and H. C. Beck, *Etched Carnelian Beads*, Antiquaries Journal, Oct., 1933.)

In addition to these, a considerable number of carnelians in various countries have a white patination over part or all of their surface. In some cases they appear to have been purposely whitened by means of soda, whilst in others they have probably been discoloured by the action of the soil in which they lay buried.

The soda treatment has a very different effect on different stones, and on different layers of the same stone, those layers which most resemble crystalline quartz being least affected. This method has sometimes been used to heighten contrast in beads. The bead was first cut so that the different layers gave the desired pattern and then a soda treatment was employed to enhance contrast making one layer white whilst the other remained its original colour. Pl. V, 1, shows an eye-bead from Ur which was treated in this manner; it is impossible to believe that in this bead the colouring and pattern are accidental. In this case the whitened parts are white to the centre of the bead.



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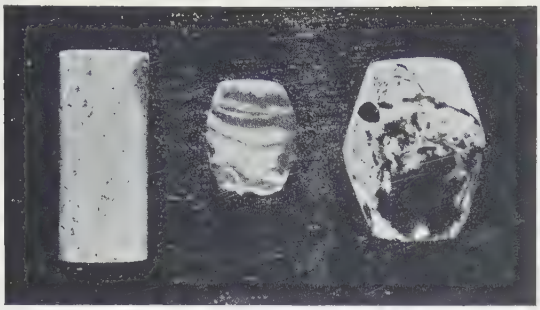

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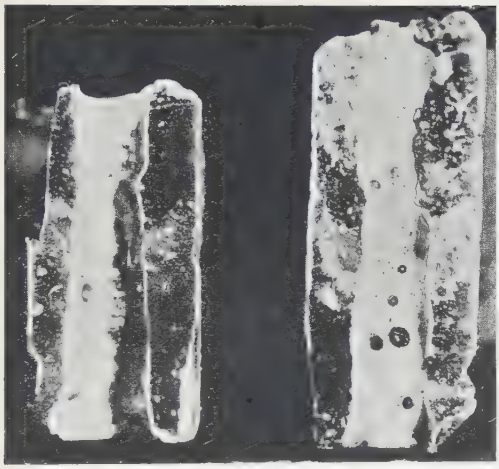

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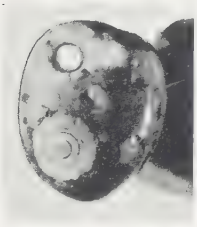
4 ×2



5 ×2

6 ×2

7 ×2

PLATE V.

A large number of beads from Mesopotamia and a few from Egypt have patches of white patination on them. This is sometimes so extensive that the whole surface is white, but it is more usual for the patination to extend over only a portion of the surface (Pl. V, 2). In some cases the patination follows the structure of the stone, whilst in others it does not. Beads with heavy patination are rarely found in Egypt, and even in Mesopotamia, where patinated beads are much more common, completely white specimens are comparatively rare, whilst a great number of the earliest beads show no trace of patination at all.

Spectroscopic examination proves that this patination is due to soda and it appears to be the same as the white layer of the etched beads. A microscope

section shows a very similar structure, the alternate light and dark layers being clearly visible.

It is very difficult to decide whether patination was produced by accident or on purpose, but I have come to the conclusion, after examining a great many specimens, that in most cases it was accidental, and probably due not to any special treatment that the bead received during manufacture but to some peculiar circumstance of its burial. One proof that the patination sometimes occurs after burial is provided by the broken cylinder bead, no. 3 in Pl. V. There is considerable patination over the fractured surface, and totally different amounts on the parts of the perforation which fitted together before it was broken. It is improbable that this bead was broken long before burial, in which case the discoloration must be due to treatment received during or after burial. The possibility of its being due to cremation has been suggested, but this seems very improbable, as, if the bead had been treated in such a way as to break it, probably more damage would have been caused to the stone and the very fine colour of the unpatinated part spoilt.

It is difficult to explain why this patination should appear on some beads whilst the great majority of early beads from Egypt and Mesopotamia show no signs of it. I have not noticed patination on Indian specimens, but have seen very extreme cases of it from Persia; and a bead from Lake Guatavita in Colombia, South America, has decided signs of it.

Spherical, banded agate beads from Persia also show signs of some chemical treatment; when not too heavily done it has the effect of heightening the contrast of the bands.

In Predynastic Egypt a number of pendants were made of a material generally called "burnt pebbles." I think that these are a silicate stone and closely allied to carnelian. They show no sign of glaze; they are usually opaque white and brown, nor is the surface very highly polished (Pl. V, 4).

One carnelian pendant, however, with a very fine pattern of circular dots or eyes (Pl. V, 5), has a brilliant glazed surface and the original bright colour of the stone has not been lost. The perforation was made after glazing. It might be suggested that the glazed surface is due to sand-polish; but this is improbable, for, in the first place, it shows spots very suggestive of glaze, and, secondly, if it was sand-polished it must have been done before the perforation. Also, the way in which the stone chipped during perforation makes it look as though it had been flawed in glazing. The provenance of this specimen is unfortunately uncertain, but it is stated to have come from Egypt.

I have tried a variety of experiments to produce a glazed stone of this sort, but although it is easy to get a very highly polished white surface, I have been quite unsuccessful in producing a highly polished surface without damaging the colour of the stone.

* * * *

In one of the graves in the Wynaad, South India, excavated by Mr. Cammiade, he discovered a number of beads of various shapes made of orthoclase felspar. These are quite white on the surface, but the centre of the bead has a red colour not unlike carnelian.

This discoloration of the outside extends for a considerable distance into the stone and is probably due to the action of some chemical, but there is not yet sufficient evidence to show whether it was done purposely whilst the bead was being made or was produced accidentally after burial.

PLATE V.

Fig. 1. Bead. Ur. The stone has been so cut that the natural structure has been used to make eyes, and the colour contrast has been artificially enhanced.	Photo. No. 245c Ref. No. B/1531 (×2)
Fig. 2. Patinated stone beads. Ur. (*a*) Complete patination; carnelian. (*b*) Patination enhancing natural structure over a portion of the bead, probably accidental: chalcedony. (*c*) Irregular partial patination: carnelian.	Photo. No. 298 Ref. No. B/2525 (×2)
Fig. 3. Carnelian cylinder bead from Ur, showing patination over fracture and unequal patination over adjoining parts of perforation.	Photo. No. 69 Ref.No. B/1269b (×2)
Fig. 4. "Burnt pebble" pendants. Egypt.	Photo. No. 294b Ref. No. B/2229 (×2)
Fig. 5. Glazed (?) eye pendant. Egypt (?).	Photo. No. 294a Ref. No. B/2563 (×2)
Fig. 6. Discoloured orthoclase felspar beads. S. India.	Photo. No. 299a Ref. No. C/15751 (×2)
Fig. 7. Section of half an orthoclase felspar bead. H. C. Beck.	Photo. No. 299b Microslide 640 (×2)

GEOMETRICAL ORNAMENT ON ARCHAIC EGYPTIAN POTTERY.

Excavation has recently discovered in different countries many remains of pottery vessels with geometrical ornament. The patterns most frequently met with are undulating lines, and triangles and rectangles whose interiors are hatched with parallel or intersecting straight lines. These designs occur on the ancient pottery of Cyprus,[1] and many such vessels of Cypriote origin are now in various museums, including the Moscow Museum of Fine Arts (figs. 1–4). Evans's excavations in Crete unearthed, in the Early Minoan strata I–III, similar pottery vessels with geometrical ornament.[2] Specimens have also been found in the Balkan peninsula at Hagia-Marina in Phocis.[3] But this mode of decoration is spread far more widely than the Mediterranean region: pottery vessels with similar motifs have been found in archaic tombs in Egypt, and they have proved to be typical of several archaic cultures in Asia. For similar designs have been found on pottery in south Mesopotamia and Elam [4]; at Tepe Hissar near Damghan (Persia), excavated by Schmidt in 1931 [5]; at Tülü and Djönü, Armenia [6]; near Anau, not far from Ashhabad, Central Asia, excavated by Pumpelly [7]; near Kaakha, Turkistan [8]; at Shahi-Tump and the other excavations of

CYPRIAN POTTERY.

(MOSCOW MUSEUM OF FINE ARTS.)

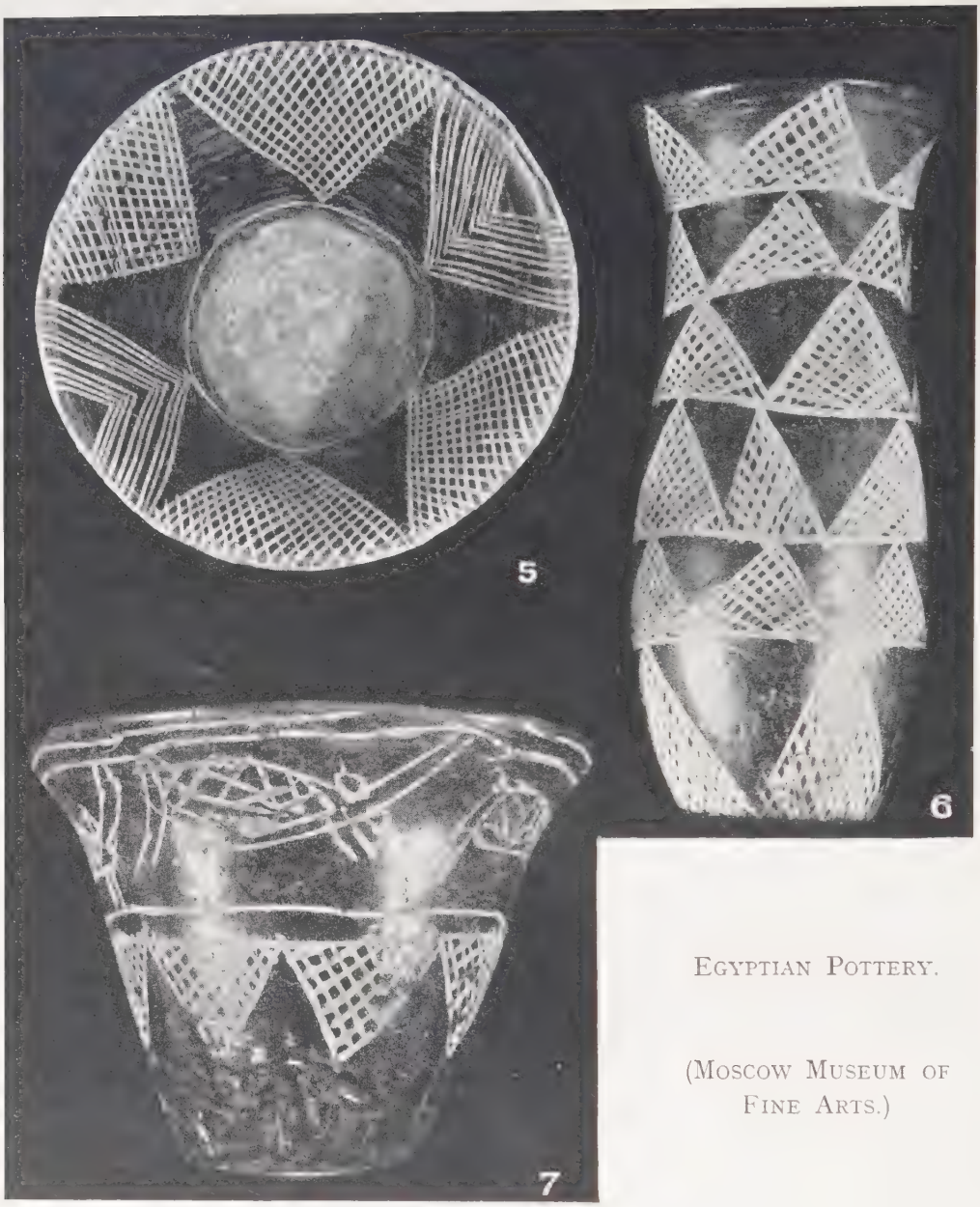
Sir Aurel Stein in Baluchistan; and in the Indus valley where, at Mohenjo-daro and Harappa, an ancient Indian culture akin to the culture of old Sumer [9] has been discovered.

As we now possess a great number of pottery vessels and sherds ornamented with geometric designs and belonging for the most part to the Chalcolithic epoch, it is possible to proceed to the analysis of these designs. The most important part of the study is the comparison of the designs on Egyptian archaic pottery with the oldest types of hieroglyphic writing.

The motifs on the pottery vessels of the prehistoric period and the inscriptions of the first two dynasties and of the predynastic epoch display a very close relationship. The archaic prototype of the hieroglyph (= *św*), (= *św*), found in the tomb of Ka-ap [10] may be cited as an example. This oldest prototype of an Egyptian hieroglyphic sign differs from the earlier specimens of the classical epoch in a more detailed design of the heraldic plant of Upper Egypt (a species of reed). We see here not only the principal parts of the plant, viz., the stem and the leaves, but also the root and the flowers. The designs on the pottery of that epoch give analogous schematic and linear images of plants or trees, in which the trunk and branches of trees, or the stems and leaves of plants, are represented only by lines.[11] Finally, many vessels of this period bear the typical "fir" ornament, presumably the schematic representation of a plant or a tree derived from a graphical prototype.[12]

The examination of the typical forms of geometric ornament on archaic vessels—viz., triangles hatched inside with parallel or intersecting straight lines, or rows of wavy lines—and their comparison with the corresponding pictures and the pictorial hieroglyphs of the same archaic epoch enable us not only to detect the close inner relationship existing between these three types of graphics, but also to appreciate the semantic value of these typical forms of geometrical ornament.

The Egyptian painter of the archaic epoch was naturally inclined to represent the forms of life and nature which surrounded him and which exercised the strongest influence upon his consciousness and his genius; he therefore attempted to depict the landscape of the country he inhabited. The triangles often found on archaic pottery vessels (figs. 5–7) are schematic representations of the earth in the broad sense of the word, or more exactly of the ground or soil. Presumably the painter tried to represent in this primitive and strictly geometrical fashion the mountainous landscape which environed him in that remote epoch when he inhabited the highlands which border the Nile valley to east and west, leading a hunter's life. Only gradually did he settle down to agriculture in oases and river valleys. Triangles representing mountains are often to be found on archaic pottery vessels, noticeably on the dish in the Moscow Museum (fig. 8), where a hunter holds four animals (dogs?) on leads. The mountainous landscape is here represented by five triangles, four of them in pairs, each of which represents two mountains separated by a valley.[13] On an archaic vessel in the Berlin Museum (No. 18566)[14] the conventional picture, almost a drawing, of two mountains with a valley between them forms but a portion of an extensive landscape composition, frequently met with on ancient pottery, in which a large boat floats on a river. On the shores of the river are animals, persons, trees, besides the typical representations of "double" mountains. This schematic method of representation had evidently become so familiar in Egyptian art that we find it even in the mural painting of the Middle Kingdom. Thus, in



Egyptian Pottery.

(Moscow Museum of Fine Arts.)

the tomb of Antefoker,[15] where the painter represents a hunting scene, the mountainous scenery is indicated by a number of triangles with smooth slopes, an evidence of the realistic aims of the art of that epoch. The rhythmical and monotonous repetition of triangles representing mountains led to the gradual transformation of a picture of mountains into the typical ornament of the pottery vessels of the archaic period. A stage in this transformation is to be observed on the Berlin vessel No. 19334. Here the double triangles are replaced by a broken line of triangles which appears to represent a mountainous and desert country and which bears a line of horned animals, perhaps antelopes or gazelles. Without these animals it would not be possible to recognize a landscape in this geometrical design.[16]

The same picture of a mountainous landscape is clearly recognisable in the

hieroglyphic signs . The conservation in these hieroglyphs of the singular, dual, and plural by mechanical doubling and trebling of the fundamental sign , mountain or hill, shows that in their oldest form these hieroglyphs go back to the epoch of pure pictorial writing, when the system of written signs possessed no means of denoting the dual and the plural by abstract determinatives. This oldest method of denoting the dual and plural in Egyptian writing, by doubling or trebling of the sign, viz., = *t³wj*, "two lands," or = *nṯrw*, "gods," survived until the New Kingdom.[17] In fact, we find in inscriptions of the first dynasties the hieroglyph meaning "locality" in the form of one, two, or three mountains joined together; the hieroglyph of two mountains is met with in an inscription on an alabaster vessel from the tomb of the Pharaoh Den; and the hieroglyphic sign "locality" in the form of three hills, , is found in a number of archaic inscriptions.[18] In its dual form, this hieroglyph forms part of the name of the Pharaoh Semti, which means "foreigner," "Desert-man," or "Highlander."[19] In one of these inscriptions we can actually discern the old pictorial basis of this hieroglyph, a mountainous desert country, since the painter rendered the sand of the desert by dots, precisely as in the representation of the desert in the tomb of Antefoker.[20]

The semasiological analysis of the words determined by the hieroglyphs of "locality," , shows clearly that these hieroglyphs were always connected with the notion of high land. The primary and simplest form, the right-angled triangle, goes back to the archaic epoch and occurs frequently in inscriptions of the Old Kingdom, viz., in the Pyramid Texts, in the inscriptions of Meir, and in the tomb of Ptahhetep.[21] Painted black, green or grey, this hieroglyph derives from the schematic representation of natural or artificial earth, a hill, or embankment of alluvial soil. Filled with dots, as, for instance, at Meir,[22] it obtains a somewhat different semantical meaning, for we are able to distinguish here its old pictorial character, the representation of the profile of desert mountains. The pictorial determinatives and the significance of words which include this hieroglyph indicate that its usual meaning was "highland." It is found in the following words in the texts of the Old Kingdom, = *ḫ³³* (Pyr. M. 202) and = *ḫ³j* (L.D. III. 24). The first of these words is determined by the hieroglyph of the triangular mountain and the second by the stairs, which means "high soil, high ground, heap, highland, hill," and particularly the first-born hill on which appeared the God and Creator, Atum. In the Middle Kingdom we find this hieroglyph in one of the Beni-Hasan Texts in the word = *ḫ³t*, determined by the hieroglyph of the irrigation canal, and meaning "high-situated land, hill, high field" (Griffith, *Beni-Hasan*, Part III, p. 5). Thus the hieroglyph , both by its form and its semantic signification, appears to be a generalized representation of high land, both in desert and in fertile and cultivated country.

We find this hieroglyph in its duplicated form in the texts of all epochs of Egyptian history, including inscriptions of the archaic epoch[23]; and in the tomb of Ptahhetep (Old Kingdom) its pictorial base is clearly emphasized,[24] for the painter very carefully although schematically represented with red spots the projections of red stone on the slopes of the desert mountain. The lower edge, consisting of a rectangle hatched with vertical lines and painted green, represents fertile valley intersected by irrigation canals. This hieroglyph is for the most part connected with the idea of

mountainous desert bordering the valley, for it is included in the word = *dw*, preserved in the Coptic ⲧⲟⲱ, "mountain, rock, hill," with the secondary specific meaning, "evil, useless," which is seen in the word = *dw*. An analogous hieroglyphic sign in the form of two joined triangles exists in the Hittite hieroglyphic inscription, the so-called seal of Tarkondemos,[25] and also among the Cretan hieroglyphic signs systematized by Evans.[26]

The triplication of the hieroglyph △ produced the frequently used hieroglyphic sign , representing in its pictorial form a mountainous desert country contiguous to a green, fertile valley, as has already been shown from the inscriptions of the Old Kingdom, viz., in the Tomb of Ptahhetep.[27] Its semantics are clearly indicated by the meaning of the words which include it. We find it as the ideogram or determinative in the word , var., = *h³śt*, "mountainous country, foreign country"; in the word

FIG. 8.—EGYPTIAN POTTERY DISH.
(MOSCOW MUSEUM OF FINE ARTS.)

= *smt*, "desert, necropolis"; in = *ḥr-t*, "mountain rock tomb"; and in = *i³bt-t*, "East." Egypt being surrounded by deserts, the word "desert" and "foreign country" are denoted by the same hieroglyph . The name of Syria, = *Rṯnw*, is determined by this very hieroglyph . And, accordingly, the name of the god of the desert foreign land was determined by the same sign = *H³*, var., = *Ḥ³*. Lastly, the same hieroglyph is seen in the name of the 6th nome of Lower Egypt,

Xois, [28] where it is found on the standard of the nome together with the hieroglyph of the bull; it thus is used as part of the hieroglyphical complex, meaning "nome, region, district," ordinarily denoted by the hieroglyph of cultivated land irrigated by canals, = *śpt.* In the oldest Sumerian inscriptions there is a sign akin to the Egyptian hieroglyph , in the form of three triangles meaning "mountains." [29] Thus in the oldest eastern systems of hieroglyphic writing the mountains were represented by a number of triangles, as in the designs on the ancient pottery.

The farmer lives on the earth and by the earth. He cultivates it, sows seeds and gathers the harvest. The earth nourishes him, and the whole cycle of his life is determined by the eternal round of the seasons and by his agricultural work. Therefore at the period of transition from primitive hunting to agriculture, the Egyptian painter naturally tended to represent both the scenery of the mountainous desert where he was still hunting and the landscape of the cultivated fields, in oases or valleys, where he was gradually accustoming himself to agriculture. But agriculture in those regions is not possible without artificial irrigation, and this may explain the great part that water began to play in his pictures. A new element, then, made its appearance in painting, viz., the "cultivation," which took its place, together with the representations of mountainous land and desert, in reliefs and designs in ornament and pictorial hieroglyphic writing.

One of the most interesting monuments of the archaic period, the mace-head of Hierakonpolis (now in the Ashmolean Museum, Oxford), represents the ceremony of the beginning of agricultural works. The king, wearing the high crown of Upper Egypt, holds in his hands the oldest agricultural tool, the hoe, and is evidently about to draw the first furrow. Behind him stand servants with high fans and in front of him a small man, bowing low, holds in his hands a basket from which he is going to sow the seeds in the furrow. The scene is laid on the bank of a canal, whose water is represented by undulating lines. This scene is of great historical interest, for it is one of the oldest representations of the "water landscape" in Egyptian art. Later on the representation of water by wavy lines became the standard method in Egyptian art.[30] Another landscape, perhaps still more archaic and not less characteristic, is painted on an ancient pottery vessel; it represents large boats, possibly funeral barks, with a background of mountains represented by triangles, and canal or river water again indicated by a number of undulating lines. The whole of this landscape is animated by figures of beasts, of ostriches, and people, which fill up the empty spaces between the mountains, the water and boats.[31]

The repetition of wavy lines to give the impression of rippling water or waves led to the gradual transformation of the picture of water into a wavy ornament. An interesting vessel in the Berlin Museum, No. 20304, published by Scharff, bears a picture of a boat, mountains, and water, but the mountains and the water are here represented by purely ornamental lines.[32] The water is represented in the same manner, viz., by wavy lines among the zig-zags of the mountains and rare figures of trees and birds on two vessels, Nos. 11564 and 11565, in the Cairo Museum, published by Quibell.[33] And on an archaic pottery vessel in the Moscow Museum of Fine Arts there is a purely ornamental form of undulating lines, evidently based upon those representing water (fig. 9).

The use of wavy lines to represent water became so enrooted in Egyptian art that it was preserved in its rigid archaic form up to the Hellenistic epoch.

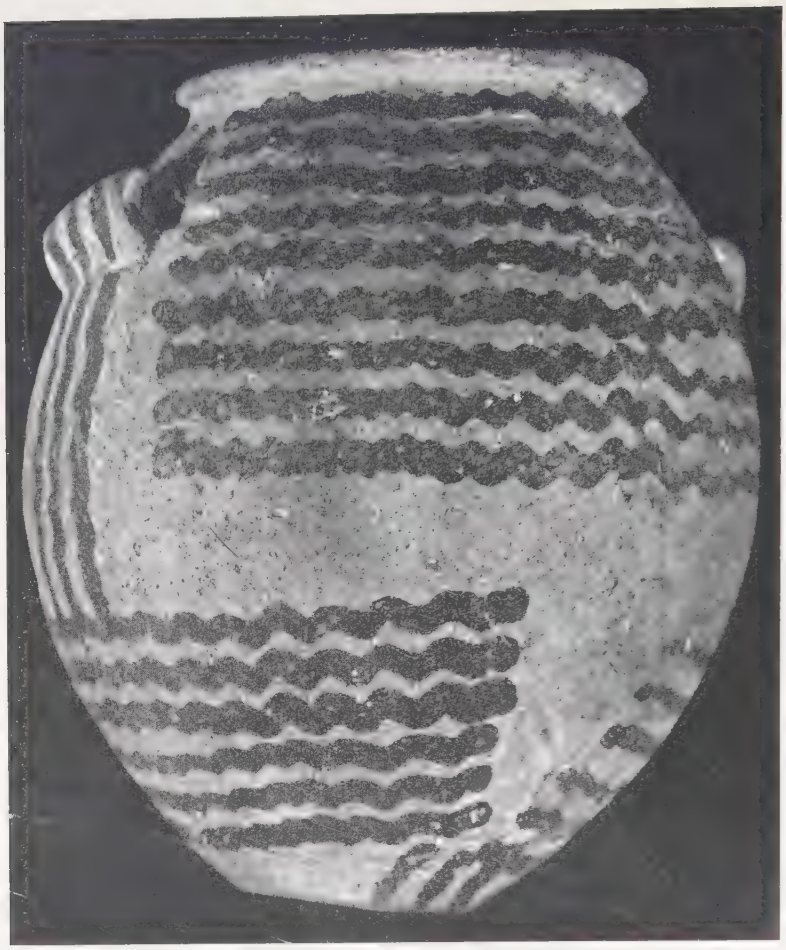


FIG. 9.—EGYPTIAN POTTERY JAR.
(MOSCOW MUSEUM OF FINE ARTS.)

When representing a rural scene, of cattle following the ox-herd through a canal, a painter of the Old Kingdom rendered the water by a row of vertical wavy lines.[34] Two thousand years later, in a picture of ploughing and harvesting on the wall of the tomb of Sn-ndm (New Kingdom), the painter represented the water of a canal by undulating lines. In the scenes of fishing which are so often met with in Egyptian tombs, especially of the New Kingdom, the archaic method of representation still obtains; monotonous undulating lines fill up the area of canal or river.[36] The boat may rest on the edge of this area, as in the scene of fishing on the tomb of Menena,[37] or the whole background may be covered with wavy lines[38]; but the principle of the schematic representation of water by wavy lines remains the same. This archaic and immutable method of indicating water is found in every scene connected with it; in representations of boats navigating on rivers and canals, of ships transporting cargoes, or people fishing, of ponds and water tanks in gardens, pools bordered with trees or supplying water for making bricks,[40] a man praying before a palm tree and water,[41] and even water running from a jug-neck, the Egyptian painter always represented the water by undulating lines which form a kind of undulating ornament. Thus was effaced the line between design and picture, for the semantics of the representation remained in both cases the same.

The Egyptian hieroglyphic writing which originated in the picture, and which frequently acquired strictly ornamental forms, indicates conspicuously the inner relationship between design, picture and hieroglyph in a plain wavy line as hieroglyph.

The hieroglyph which does duty for the alphabetic sign "n" goes back in its pictorial form to the representation of an undulating surface of water. This sign is found in the inscriptions of the first dynasties and enters into the name of the Pharaoh Den .[43] As a phonetic sign, it forms part of old words meaning water: = *nw*, "primordial water," and = *nw*, "stream of water." The same sign forms an important part of the word = *nt*, "water,"[44] the notion of water being here determined by three wavy lines, viz., by the trebling of the hieroglyph, which is the oldest form of denoting collective names and plurals. In the word = *mw*, also, "water" is denoted by three wavy lines, to which corresponds the phoneme "mw" conserved in the Coptic **ⲙⲟⲟⲩ**. Thus the phoneme of the word "water" is intimately connected with the semantic base of the pictorial hieroglyph of three wavy lines. And the most interesting feature is the simultaneous presences therein of two numbers, the singular and the plural, as it denotes "waters, liquid, sperm, son, water."[45] Purely ornamental forms of this hieroglyph are seen in the inscriptions in the tomb of Ptahhetep, in the tombs of Beni-Hasan, and in the texts of Deir-el-Bahri.[46]

This hieroglyph of water is intimately connected with another sign representing the canal . This latter hieroglyph usually has the form of a rectangle, filled with vertical zigzag lines and painted blue to give the idea of a space filled with water. The upper and the lower rectangular borders, also painted blue, represent the shores of the canal.* In its simplified schematic form this hieroglyph occurs in the inscriptions of the archaic epoch,[47] and particularly in the title of an official, , which may be translated as "local superintendent," and Brugsch translates as "superintendent of canals." It is quite natural that by this epoch, when the irrigation network was of great importance in the economic life of the country and was the charge of the whole community, district or central authority, the local officials or nomarchs had to direct a great deal of their activity to its maintenance. Sir Flinders Petrie, one of the greatest authorities on the history of ancient Egypt, counts fifteen mentions of this ancient official title in the royal tombs of the first dynasties.[48]

This same hieroglyph is an ideogram in the word = *mr*, "canal," and determines the notions, "river, lake, sea," for example, = *w³d-wr*, "sea," literally, "the great green," and = *ḥ'pj*, "Nile." From the period of the Old Kingdom it is very often met with in the complex determinative meaning, "river, sea, lake," , as = *itrw*, "river," or = *ḫnw*, "brook, spring." A variant of this hieroglyphic sign, a somewhat curved form, also represents the irrigation canal, [cf. the Sumerian sign -e-(g)=canal†]. The hieroglyph , representing a rectangular basin or pool, very conspicuously conserved its original pictorial form, filled in, as it is, with wavy lines. This hieroglyph forms the word = *š*, "lake, pool, basin," as well as forming part of the word , "irrigated land," which

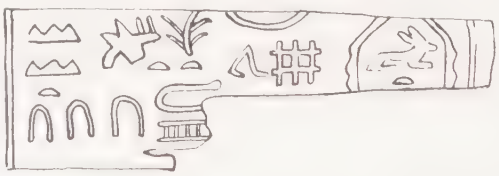
* Davies, *Ptahhetep*, vol. I, pl. XI, no. 218. Cf. the Sumerian sign = water-basin; Langdon, *Sumerian Grammar*, p. 292.

† Langdon, *Sumerian Grammar*, p. 267.

in a somewhat modified phoneme sounds as *ś<u>t</u>ʾt*, "irrigated soil," or, metaphorically, "unit of earth measurement—arura".[49] The hieroglyph "water" is here closely connected with the sememe, "irrigated land," which is proof of the close amalgamation of the signs, and accordingly of the notions, "water" and "earth," thereby emphasizing the importance of artificial irrigation in the agriculture of ancient Egypt.

Identical hieroglyphic signs denoting water are found in other systems of pictorial writing. Such is the old Sumerian sign ≃ = mu, which is the simplified form of two undulating lines, and also the Sumerian sign = lum, "brook," which goes back to three undulating lines and is met with in a number of variants.[50] Such also is the Chinese sign for "river," the stream of water collected from many tributaries. It is of interest to observe that the Chinese script, in addition to the sign 川 巛, composed of three wavy lines, also has signs made up of two wavy lines, 川 川, "water stream, river," and even a single line denoting "little brook." There are, moreover, compound hieroglyphs: 巛, "river barred by a dam, disaster," and 災, "uncultivated lands, wasted by a flood". In all these signs, Egyptian, Sumerian, and Chinese, water is represented by wavy lines.[51]

But if the hieroglyphic signs connected with the notions of water and earth are so closely related by their pictorial form as well as by their meaning, an analogous connection may have existed between the oldest forms of the corresponding ornament and the picture connected with it. In fact, we find on many pottery vessels of ancient Egypt original ornaments of exactly this character.[52] These ornaments consist sometimes of triangles, filled with parallel or intersecting straight lines (figs. 5–7), and sometimes of squares and rectangles covered inside with a chessboard-like net. These designs enter into large landscape compositions, as on the Moscow dish (fig. 8), where the hatched triangles represent a mountainous land in which a man is hunting; whereas on the Berlin vessels, Nos. 19334 and 21098, from Abusir-el-Meleq,[53] rectangles with chessboard designs alternate with representations of beasts and mountains—proof that we have here not a monotonous design, but an attempt by the painter to represent the forms of nature surrounding him, and the ground intersected by a network of canals or divided into separate fields. This latter suggestion is confirmed by the comparison of the chessboard and the semi-chessboard ornaments with analogous hieroglyphs going back to the remotest epochs of Egyptian history, for instance, the very interesting hieroglyph 𓈖, "region, district, nome". This sign is met with in a number of inscriptions of the archaic epoch,[54] and particularly on a tablet of ebony, where an interesting historical inscription runs as follows:



"There goes the lord, the king of Upper and Lower Egypt,
Semti, who took possession of thirty regions."[55]

We find it also denoting the word "nome" on a number of other objects from the same period,[56] its form usually being a rectangle filled with parallel vertical lines which may represent irrigation canals, 𓈖, "lake, canal." Examples of this hieroglyph are found back to the period of the Old Kingdom, notably

in the tomb of Ptahhetep, where the word "nome" occurs in this form. But the classical form of this hieroglyph is that which approaches nearest to the chess-board ornament, the rectangle divided into a number of small rectangles by five or six vertical lines and a horizontal one. We find this hieroglyph in the Pyramid Texts (Pyr. 126), but it is met with in its most distinctive form in the beautiful inscriptions of the Middle Kingdom at El-Bersheh and Beni-Hasan, in the names of various *nomes*. Usually this hieroglyph plays the part of ideogram or determinative in the word *var.* = *śp-t*, "district, region, nome". The names of the nomes, which include sacred *totem*-standards, are very often connected with these pictorial signs of land divided up by canals or into fields.

An analogous pictorial hieroglyph denoting a field divided into separate parts by irrigation canals is found in the oldest Sumerian inscriptions, notably on the Blau monuments (Brit. Mus., No. 86261, 1), and in a somewhat complicated form in the inscriptions from Fara.[58] It is probable that the old Chinese hieroglyph 田, "field, village," goes back to the same fundamental picture.

Thus the study of the geometric designs on ancient pottery vessels, and comparison of them with the analogous pictures and the pictorial hieroglyphic signs of the various archaic scripts, shows that the painter of those days tried to represent schematically in these ornaments the forms of nature and the landscapes (mountains, cultivated land divided into separate parts by irrigation canals, and water) which surrounded him and exercised a strong influence on his consciousness and genius.

V. I. Avdief.
(Museum of Fine Arts, Moscow.)

[1] Cesnola, *Cypern*, Vol. 2, taf. 39, 42, 45; Vol. 1, pls. 5, 13.
Perrot et Chipiez, *Cypre*, p. 689, fig. 493; p. 695.
[2] Evans, *Palace of Minos*, Vol. 1, p. 63, fig. 27; p. 74, fig. 42; p. 113, fig. 80.
[3] Fimmen, *Kretisch-Mikenische Kultur*, ss. 132–3, Abt. 128.
Bogaevski, *Krit i Mikeni* (*Crete and Mycenae*), fig. 53. (In Russian.)
[4] Pézard et Pottier, *Catalogue des antiquités de la Susiane au Musée du Louvre*, Paris, 1926, pls. 82–9.
[5] E. F. Schmidt, *Tepe Hissar Excavations*, 1931, in Museum Journal, Vol. 23, no. 4, pls. 82–9, Philadelphia, 1933.
[6] De Morgan, *Mission . . . en Perse*, Vol. 4, pp. 109, 116, 117.
[7] Pumpelly, *Expedition in Turkestan*, Vol. 1, p. 133, nos. 106–13.
King, *History of Sumer and Akkad*, p. 356, fig. 69.
Kobranov, *Anau*, 1927, pls. 13–14, 36. (In Russian.)
[8] The pottery found there is in the Moscow Museum of Anthropology, nos. 62–N, 62–31, 62–34, 62–35.
[9] Gordon Childe, "Notes on some Indian and East Iranian Pottery," *Ancient Egypt and the East*, 1933, Parts 1, 2, pp. 15–25.
[10] Flinders Petrie, *Abydos*, Vol. 1, pls. 1, 2.
[11] Capart, *Les débuts de l'art en Egypte*, pp. 115, 114, 106.
A. Scharff, *Grundzuege zur aegyptischen Vorgeschichte*, taf. 6, f.
V. Avdiev, *Proizvodstva i chudozhestvenie remiosla v drevnem Egipte* (*Industry and Artistic Crafts in Ancient Egypt*), Moscow, 1930, p. 11. (In Russian.)
[12] Scharff-Moeller, *Die archeologischen Ergebnisse . . . von Abusir-el-Meleq*, 1926, taf. 12, no. 49; Quibell, *Archaic Objects*, Vol. 2, pl. 21.

[13] V. Avdiev, op. cit., p. 11.
[14] Scharff-Moeller, op. cit., S. 21, no. 32.
[15] W. Wreszinski, *Atlas*, Band 1, taf. 215.
[16] Scharff-Moeller, op. cit., S. 21, no. 33; taf. 5–c; Scharff, op. cit., taf. 5–c; Quibell, op. cit., Vol. 2, pl. 23; Capart, op. cit., pp. 110–13.
[17] A. Gardiner, *Egyptian Grammar*, p. 59.
[18] Hilda Petrie, *Egyptian Hieroglyphs of the First and Second Dynasties*, pl. 22, nos. 505–9. This excellent selection of Egyptian archaic hieroglyphs is very useful for the study of the hieroglyphic writing of the archaic epoch.
[19] Flinders Petrie, *Royal Tombs*, Vol. 2, pl. 38.
[20] W. Wreszinski, *Atlas*, Band 1, taf. 215.
[21] Davies, *Ptahhetep*, Vol. 1, pl. 11, no. 217.
[22] Blackman, *Meir*, Vol. II, 17, nos. 36–7.
[23] Hilda Petrie, *Egyptian Hieroglyphs*, pl. 21, nos. 501–4.
[24] Davies, *Ptahhetep*, Vol. 1, pl. 11, no. 210.
[25] Jensen, *Geschichte der Schrift*, S. 62.
[26] Evans, *Palace of Minos*, Vol. 1, fig. 214, no. 114.
[27] Davies, *Ptahhetep*, Vol. 1, pl. 11, no. 210.
[28] Pyr., 1013.
[29] Deimel, *Liste der archaischen Keilschriftzeichen von Fara*, S. 48, no. 461.
[30] Capart, op. cit., p. 243.
[31] Ibid., p. 118.
[32] A. Scharff, op. cit., taf. 5, c.
[33] Quibell, op. cit., Vol. 2, pls. 21–3.
[34] H. Schaefer, *Von Aegyptischer Kunst*, Auflage 2, taf. 16, 1.
[35] W. Wreszinski, *Atlas*, Band 1, taf. 19. [36] Ibid., taf. 2, 250, 364. [37] Ibid., taf. 2. [38] Ibid., taf. 364. [39] Ibid., taf. 42, 308, 387, 410. [40] Ibid., taf. 3, 66, 92, 222, 319. [41] Ibid., taf. 111.
[42] Schaefer, *Von Aegyptischer Kunst*, Leipzig, 1922, taf. 43, 2.
[43] Flinders Petrie, *Royal Tombs*, Vol. 2, pl. 7.
[44] Sethe, *Alphabet*, 153.
[45] Erman-Grapow, *Aegyptisches Handwoerterbuch*, S. 63.
[46] Davies, *Ptahhetep*, Vol. 1, pl. 11, no. 211; Griffith, *Hieroglyphs*, pl. 11, 176.
[47] Hilda Petrie, *Egyptian Hieroglyphs*, pl. 22, 512; pl. 23, 529–31, 542–8.
[48] Flinders Petrie, *Royal Tombs*, Vol. 2, p. 53, nos. 24, 49, 56, 64–7, 84, 149, 153, 154, 158, 161, 163, 178.
[49] *Urkunden des aegyptischen Altertums*, Band. 4, 173, 1.
[50] Langdon, *Sumerian Grammar*, 1911, p. 261; Deimel, op. cit., S. 22, no. 194.
[51] L. Wieger, *Caractères chinois, Etymologie, Graphies, Lexiques*, Moscow, 1931, pp. 22–5. (Russian translation by Itigin.)
[52] Capart, op. cit., 110, 117; Quibell, op. cit., Vol. 2, pl. 21, nos. 11551, 11535; Scharff-Moeller, op. cit., taf. 12, no. 47; S. 21, no. 33.
[53] Ibid., S. 21, no. 33.
[54] Flinders Petrie, *Royal Tombs*, Vol. 1, p. 28, no. 37.
Hilda Petrie, op. cit., pl. 22, no. 511.
[55] Flinders Petrie, *Royal Tombs*, Vol. 1, p. XV, 18.
[56] Ibid., Vol. 2, pl. 5, no. 12.
[57] Davies, *Ptahhetep*, Vol. 1, pl. 11, no. 206.
[58] Deimel, op. cit., S. 12; Langdon, *Sumerian Grammar*, p. 269.
[59] L. Wieger, op. cit., p. 526.

A PANTHEISTIC REPRESENTATION OF AMON IN THE PETRIE COLLECTION.

The little figure of an Egyptian God published here (fig. 1a, 1b) belongs to the Petrie Collection at University College, London. It is 5·3 cm. high and covered with a light green paste, and it represents a dwarfish figure with crooked legs, whose feet are broken off. The head is that of a ram with a wig, and is turned backwards. Although other collections, for instance, the Louvre and the Musée Egyptien de Marseille [1], possess similar representations, no object of this kind has, to my knowledge, ever been published or discussed. The figure belongs to the type of the so-called pantheistic deities which are frequently met with at a later period of Egyptian civilisation. The body resembles that of Ptah-Petek,[2] while the head is that of the god Amon Arietinus described by Herodotus :

'Απὸ τούτου κριοπρόσωπον τοῦ Διὸς τῶγαλμα ποιεῦσι Αἰγύπτιοι. . . . . 'Αμοῦν γὰρ Αἰγύπτιοι καλέουσι τὸν Δία. [3] "From this the Egyptians make their statues of Jupiter ram-faced . . . for the Egyptians call Jupiter Amon."

The Petek figures are themselves combined types of the God Ptah and of Horus Harpocrates, described in the Chester Beatty Papyrus and by Plutarch as "feeble in his limbs." [4] These figures are identical in meaning with the

Fig. 1a. Fig. 1b.

representation in Crypt No. 9 of the Temple of Denderah, where the young sun appears under the aspect of a child with crooked legs accompanied by an inscription above him : , " The sun who becomes flesh ".[5]

Gods or demons facing backwards exist from the earliest times on in religious conception of the Egyptians. Thus, the celestial ferryman in the Pyramid texts is called " The One who looks behind ", or " His face is behind him ".[6] A god facing backward acts as one of the judges in the 125th chapter of the Book of the Dead. In domestic magic male or female demons, called " The one whose nose is turned backward, and whose face is turned away ",[7] personified sickness, and might be conjured and expelled by means of a preparation of honey.[8]

The figure in the Petrie collection is, however, not one of these semi-gods or demons ; it is in all probability a representation of the Sun-god, a kind of illustration to a theological speculation. Similar representations appear in the Book of the Dead of the Saïte epoch, as in a vignette of Chapter 164 which shows a dwarf with two heads, in the posture of Min and with the head-dress of Amon.[9] The Louvre possesses a little bronze figure of a god with two heads, the one looking backwards being that of a ram. The two aspects of the Sun-god —the Day-sun and the Night-sun—are illustrated by a painting in the tomb of Queen Nefert-ari. Two goddesses, Isis and Nephthys, adore a mummy-shaped figure with the head of a ram, with the horns of Khnum, called Râ. On one side is the inscription, " This is Râ who rests ( ) in Osiris " ; on the other, " Osiris who rests ( ) in Râ." It is evident that the whole illustrates some religious speculation of the Egyptian priests.[10]

A similar speculation found its expression in the figure in the Petrie Collection. The two directions—that of the body and that of the head looking backwards—may be explained by a passage from the Book of the Dead which was applied to the Sun-god and described his everlastingness : " I am yesterday and to-morrow, Horus who is born a second time ".[11]

As we have here a combined figure of three gods—the head being that of Amon, the body a compound of Ptah and of Horus the child—a passage from the Leiden papyrus fully expresses the idea, substituting only Râ for Horus : " Three are all gods, Amon, Re, and Ptah ; there is none like them, concealing (inm) his name as Amon. To him belongs Re as face ; his body is Ptah ".[12] The last sentence may explain why the head is turned backwards : it is to indicate the " deus invisibilis," the god who, according to another passage of the same hymn, is thus described : " One is Amon, concealing (imn) himself from them (*i.e.*, humanity) ; hiding himself from the gods. His aspect is not known."[13]

A. Piankoff.

[1] Louvre E. 5712 ; G. Maspero, *Catalogue du Musée Egyptien de Marseille*, Paris, 1889, p. 154, no. 779.

[2] A. Erman, *Aegyptische Religion*, 1934, p. 148.

[3] Herodotus, II, 42 ; *A.Z.*, 1877, pp. 11 ff. ; *A.Z.* 54, pl. II, p. 76.

[4] A. Gardiner, *Chester Beatty Papyrus*, Part I, p. 16.

[5] Étienne Drioton, " Un Oudja à représentation hermopolitaine " in *Revue d'Egyptologie*, Tome I, Fasc. 1–2, pp. 81 ff.

[6] Pyramid Texts, edited by K. Sethe, §§ 517, 999, 1091, 1201, 1227, 1441 ; §§ 383, 597, 599, 925, 1225, 1227 and 1769.

[7] A. ERMAN, *Zaubersprüche für Mutter und Kind*, Berlin, 1901, pp. 11 ff.

[8] Cf. the punishment inflicted by Dante on those who had practised magic and the arts of divination:

> " . . . che da le reni era tornato il volto,
> ed in dietro venir li convenia,
> perchè 'l veder dinanzi era lor tolto."
>
> (*Inferno*, Canto XX.)

[9] LEPSIUS, *Das Todtenbuch der Aegypter*, pl. LXXVIII.

[10] G. FOUCART, *La belle fête de la vallée*, pl. XXIII (*Bulletin de l'Institut français d'archéologie orientale*, t. XXIV, 2[e] fascicule).

[11] Chapter LXIV, cf. *Rec. de trav.*, 37, p. 7.

FIG. 2a.

FIG. 2b.

[12] A. GARDINER in *Ä.Z.*, 42, p. 35, and K. SETHE, *Amun und die acht Urgötter von Hermopolis*, and 179 ff. Cf. the pantheistic representation of a divinity (figs. 2a, 2b) which combines, under the head of a ram of Amon the body of Ptah Petek and the body of the Hawk of Horus. See: DARESSY, *Catalogue Général*, Caire, *Statues de Divinités*, no. 38829.

[13] *Ä.Z.*, 42, p. 34. Cf. MORET, "Le rituel du culte divin journalier en Egypte", *Annales du Musée Guimet*, XIV, p. 134.

CHANGES IN THE EGYPTIAN COAST.

The rarity of earth movements in Northern Europe has hindered us from realising how frequent such changes have been in Mediterranean lands. In Britain the last great change was during the age of the Hyksos in Egypt; then the land sank 80 ft. between 3000 and 1500 B.C.[1] In the Mediterranean, however, there is a serious earthquake about every two years, and many areas have changed in level since Roman times.

Changes of level have ulterior effects, which are as much indirect as direct. When the land sinks it is inundated, as in Norfolk or the Delta of Egypt; long estuaries are formed in valleys, which are gradually silted up during some thousands of years. The sea is continually rising against a firm shore, and no sands are exposed round most of the tideless Mediterranean. But when the land rises there is always a sandy level exposed, and on the Palestine coast that is swept over by the usual westerly gales, which carry the sand inland.

The Delta of Egypt and neighbouring coasts have suffered the usual fate of deltas. The Rhone Delta has sunk 40 ft. in 3000 years.[2] The Nile Delta, similarly, loaded with a hundred feet of deposits, has sunk 40 ft. at Alexandria, and even more to the eastward.

The great new capital called the "Dwelling of Rameses," in the north-east of the Delta, was celebrated for its delightful situation.[3] If this were at Pelusium it is now in a swampy desolation, reached by deep wading in mud; if it were at Tanis it is now on salt marshes, without any cultivation within ten miles. Similarly, the original allotment of land into nomes extended down to the coast where now there is a region of swamps and lakes.

The same story is found when excavations are attempted. Whether at Alexandria on the west, at Buto in the mid-Delta, or at Nebesheh on the east, the Ptolemaic level, or the XXVIth dynasty, is the present water level.

With these preliminaries about the Delta, we can better understand the conditions of the neighbouring coast land stretching northward into Palestine. The earth movements there have been both violent, in earthquakes, and gradual, in changes of level.

In 30 B.C. a great earthquake desolated Judaea, large numbers of cattle were killed, and 10,000 men lost their lives.[4]

About A.D. 20 Strabo stated, "During my stay at Alexandria the sea rose so high near Palestine and Mount Kasios as to overflow the land; so that the journey from Kasios into Palestine might have been undertaken by water."[5] He describes an earthquake which accompanied this irruption, thus: "At Mount Kasios in Egypt the ground to a considerable distance, after a violent and single shock fell in parts, at once exchanging places; the elevated parts opposed the access of the sea, and parts which had subsided admitted it. Another shock occurred, and the place recovered its ancient positions, except that there was an alteration in some places and none in others."[6]

A description of an earthquake wave at Crete is given by Philostratus in A.D. 45: "A violent concussion of the earth shook the whole island, followed by a rumbling sound proceeding from the ground; in consequence of which

the sea withdrew about 7 stadia (furlongs) from the shore, . . . on the same day and hour in which the earthquake was felt, an island rose out of the sea between Thera and Crete." [7]

In A.D. 68 a further sinking of the land is recorded as a prodigy before the death of Nero, "the Egyptian sea overflowed the coasts."[8]

Of the great earthquake at the close of A.D. 114 there is an account by Dion Cassius; it was at a time when the expedition of Trajan to Parthia, and business related to that, had crowded the city of Antioch. "At first there was heard a kind of bellowing noise, then the earth heaved up, and the houses shook. There was a dreadful noise of the crashing of stones, bricks, and tiles which were rent from their places. The air was filled so thick with dust that people could not see each other. Several persons were raised in the air, and turned out of their houses. Some were crippled, others killed. The violence of the shock was so extreme that trees were torn up by the roots. . . . As it continued for several days and nights, nobody knew what remedy to apply to it. . . . Mount Corasus shook to that degree that it perfectly bowed, and seemed just ready to fall upon the city. There were other mountains also that bowed their heads. Water appeared in places where none had ever been seen, and other places were dry that had always received water."[9]

Evidences of large changes of level may be seen in the Wady Ghazzeh. At 130 ft. above sea level the valley is filled with silt, having a flat surface level from side to side, and for some miles up the valley from Tell Jemmeh (Gerar). Such a level surface, from which sloping valley sides rise up, could not possibly be due to wind action; nothing but deposit under water could produce such a surface. I searched two or three miles downstream to see if the valley had been dammed or obstructed, but there was no break in its steady widening. I found, however, similar silting not quite so high at Um Gerar, two miles downstream, with masses of Roman pottery thrown in it, and some pottery at the bottom of the deposits. I also found Roman glass 12 feet down in the silt at Tell Jemmeh.

The only possible conclusion seems to be that the sea level had been up to 130 ft. in Roman times. Confirmation of this appears at the coast near Khan Yunis, where hills rising about 80 feet above the sea are thickly covered with quite fresh shells, not weathered or sand worn. Moreover, the country is dotted with *khurbehs*, ruins of villages, of about the period of Justinian, but none of them are below the 130 ft. level. As the lower positions are the better irrigated, it seems impossible to suppose that the best position would be avoided. The material evidence then is for a depression of 130 ft. at about the fourth or fifth century, followed by a rise at a later period. The depression is not likely to have taken place before that time, as at Anthedon the Hellenistic and Roman towns are at a low level with few coins in the district later than A.D. 400 in date.

In Lake Menzaleh there are scattered the sites of dozens of towns and villages, now submerged. Tennīs was a considerable city in A.D. 440; by 535 the land was partly submerged. The main flooding of Menzaleh took place in A.D. 554 By 1193 the last inhabitants had removed to Damietta. All this points to a subsidence beginning in the Roman period and culminating about A.D. 1200 Probably the course of this change of level was emphasised by the great earthquakes on this coast which are recorded in A.D. 934, 954, 1033, over all Syria in A.D. 1202, and in 1303.[10]

It is often supposed that submersion must leave some permanent mark or change on the land, yet at Pozzuoli who would credit that there had been

a great submergence, were it not for the Pholas borings in temple columns, which supplied the standard case used by Lyell in his evidence of changes of levels? Only where a low level has long been exposed to waves can we expect to find obvious beach levels, and in any country with wild vegetation the traces of submergence are easily invisible.

Turn now to the west of the Delta. Excavations were made by Hogarth on clear land in Alexandria, but he couid not reach the Greek city which lies below water level. In the sea there are visible large quays and walls which would have been in use when the land was 23 ft. higher. As the Ptolemaic city must have been about this height above sea level, it is clear that these quays are the works of such an age. The romance that they date from prehistoric Greek times is baseless.

The tombs along the coast to Meks have their floors awash with the present sea, so must have been cut when at a higher level.

Though there has been a great depression of the land, it is now rising again. On the shore at Alexandria I was surprised to see a stack of water-laid débris and pottery, which rises to 18 feet above sea level with loose stuff over it up to 23 feet. So the total depression has been 23 feet by the quays and, say, 20 feet at the stack, or 43 feet, of which nearly half the amount has now been recovered.

With these evidences of changes of level before us we can interpret the invasion of the coast by sand dunes. Down to the 1st century there would be few exposed sand beaches, and little chance of any serious amount of sand being wind-borne inland. This condition ceased about the 14th century, when the land began to rise, exposing sand beaches which could be blown inland. This lifting of sand from the sea seems by now to have diminished, as there is a wide flat shore for a quarter of a mile inland at Anthedon, and the action of the wind is mainly spent in pushing forward the dune masses, over 50 ft. high and 2 or 3 miles wide, across the country.

FLINDERS PETRIE.

[1] Clement Reid, *Submerged Forests*, pp. 114, 120. Roman level at the Thames, 16 ft. down: *Nature*, 23 Aug., 1930. Cardigan Bay flooded A.D. 430: see 37th triad, Probert, *Ancient Land of Cambria*.

[2] *Nature*, 1930, p. 604.

[3] Erman, *Egyptian Literature*, pp. 206–7.

[4] Josephus, *Antiquities*, XV, v, 2.

[5] Strabo I, ii, 16.

[6] Strabo XVI, ii, 26; perhaps part of the great earthquake of A.D. 17 when twelve cities of Asia were wrecked.

[7] *Life of Apollonius*, xxxiv. (Pliny confused the consulates of A.D. 3 and 46.)

[8] Dion Cassius in *Nero*.

[9] Dion Cassius in *Trajan*.

[10] Poole, *Student's History*, pp. 81, 88, 216, 301.

THE PULL-SAW IN EGYPT.

THE earliest existing model of an Egyptian saw dates from the IIIrd dynasty (Petrie, *Tools and Weapons*, pl. XLVIII), but there remains from the Ist dynasty a fragment of a wooden sarcophagus clearly showing the marks of a saw. The lack of regularity in the direction of these marks suggests that the proper form and use of the tool was not known at that time. The earliest saws must have had the teeth just roughly notched out with no particular regard for the uniform direction of the cutting edge. They could not therefore be termed " true " saws, *i.e.*, that type which has the straight, or cutting, edge of the teeth arranged in one particular direction. In the Vth dynasty we begin to get evidence from the tomb paintings of the existence of the true saw.

Lately, however, an important find has been made in the Indus valley (E. Mackay, *The Indus Civilisation*, p. 126). It is the remains of a $16\frac{1}{2}$ inch bronze saw dating to *c.* 2500 B.C. The teeth are only roughly notched out, but the interest lies in the " set " of the teeth, which are undulated. In modern saws the only type which has undulated teeth is the hack saw, which is used solely for cutting metal. The ordinary wood-cutting saw has each tooth set separately in order to prevent binding, but this method while perfectly adequate for dealing with wood is useless where metal is concerned ; only the undulated type will cut metal without binding. It is, then, possible that the Indus Valley people were aware of this fact, and that the specimen found at Mohenjo-daro is a metal-cutting saw. If so, they must either have used this type of saw for cutting both wood and metal, which is quite possible, or have had some other kind of saw for wood. In any case this type of saw is unique at so early a period ; no specimen of an undulated saw has come to light in Egypt or Sumer.

The Vth dynasty tomb-paintings give no hint of metal-sawing, but there is abundant evidence as to how the Egyptians sawed wood. An unusual feature in these scenes is that the carpenter has placed the block to be sawn in an upright position, instead of in the horizontal one common at the present day. Fig. 1 is typical ; the block was tied firmly to a post fixed in the ground and then cut through in a downward direction. There were apparently two methods of tying the blocks :—

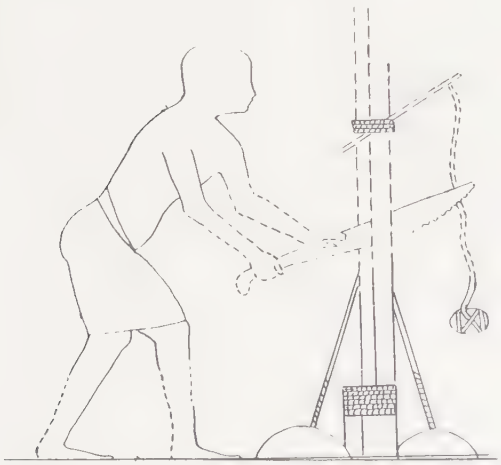


Fig: 1. DESHASHEH Plate XXI.

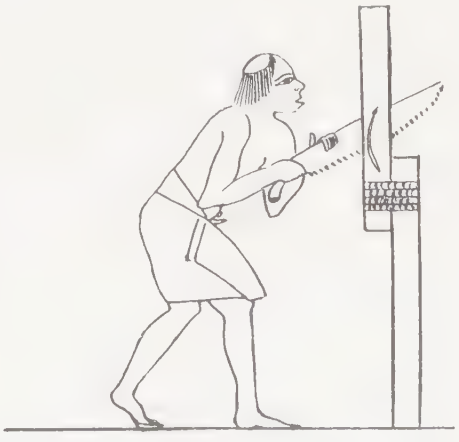


Fig: 2. TOMB of TWO SCULPTORS. Plate XI.

(*a*). This method would be possible only for very short blocks of soft wood. The plank was so tied that a small section extended above the post. When this was sawn through, the binding was removed, the block pushed further up and re-bound, after which the sawing continued.

By this method the carpenter usually had the block between himself and the post (fig. 2). For the last few inches, the binding would of course be retied above the saw, the block being placed at the side of the post, or the work would be finished on the ground.

(*b*). The second way, suitable for long or short planks, was to tie the block to the side of the post, so that there was no interference while sawing (fig. 3). When the saw had cut down to the upper binding, this was untied and replaced higher up, above the saw, which then continued its downward journey. In some scenes the lower binding shown in fig. 3 is lacking, and it appears to have been optional. It would, however, facilitate the work to have both an upper and a lower binding.

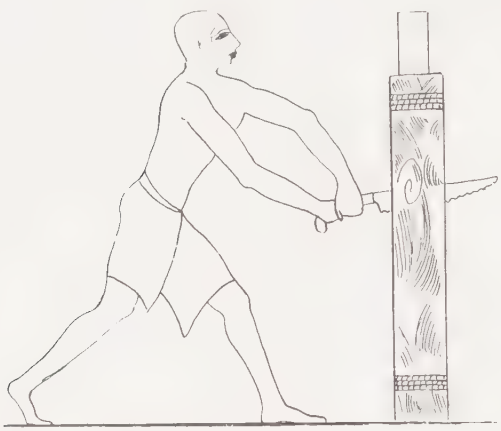


Fig: 3 REKHMARA Plate XVII

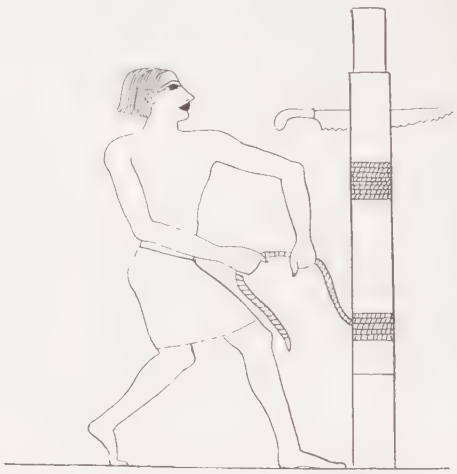


Fig: 4 REKHMARA Plate XVIII.

In fig. 4, a carpenter is evidently using the first method. He is untying the wood in order to push the block up. Had he adopted the second method, it would have been unnecessary at that stage to untie the lower binding. He is obviously intending to remove both bindings.

With either of these methods a weighted stick, passed between the rope and the post, was often used (fig. 1). This acted as a tourniquet and automatically counteracted any loosening of the binding due to the vibration of sawing.

At first sight it is difficult to see how the carpenter could operate his saw in the cut between the tightly bound sides. The artist gives no hint, but modern methods provide a solution. In sawing planks or boards of a fair length wedges are always necessary to prevent the cut wood from "pinching", *i.e.*, closing together behind the saw and gripping it immovably. In hand sawing wooden wedges are used, while a small steel tongue, known as a "riving tool", is fixed upright behind a circular saw to perform the same duty. In the method used by the Egyptians, the wedge was driven in and then held in position by the binding. One wedge would be sufficient unless the plank were very wide. As, however, the actual wedge was hidden by the binding, it could not appear in the

pictured scene. In *Beni Hassan I* (Newberry), pl. XIII, lowest register, the artist has tried to suggest the necessary gap, but again could not show the wedges.

Regarding the saw itself, so few examples from Egypt have survived, and those so fragmentary (Garstang, *Burial Customs*, fig. 66), that it is quite impossible to discover which of the two varieties of saw they were, *i.e.*, the " push- " or the " pull-" saw. The push-saw has the cutting edge of the teeth set away from the handle, and the main force is used in pushing the saw forward. It is the type generally used in Europe to-day. The pull-saw has the teeth set in the opposite direction and needs the main force to be applied in pulling. This type is rare in the western world, except in Greece, where it is universally used and has been from time immemorial. It is also commonly used in the Far East. But though the evidence of the object itself is lacking, the tomb scenes show which type the Egyptians must have used. A careful examination of these scenes brings out four points common to them all:

(1) The block to be sawn is always upright and never horizontal. In the tomb of Menkheper-ra-senb (N. de G. Davies, *Tomb of Menkheper-ra-senb*, pls. XI, XII) objects which it is suggested are ivory tusks are also placed upright while being sawn.

(2) The saw always has its tip pointing upwards.

(3) The cutting is often done almost at breast-level, the man standing well away from his work.

(4) Invariably both hands are on the saw, and the drawing of arms and shoulders usually suggests that the man is exerting his strength to pull the saw towards him. For instance, in fig. 3 the carpenter has obviously pushed the saw lightly through, and is about to use his full strength to pull it back. The position of the legs as well as of the arms shows this.

It is conceded in all craftsmanship that the most convenient position must evolve naturally out of experience in the use of a tool. This position having once been found is invariably adhered to unless the tool itself changes fundamentally. Thus in modern times anything to be sawn is always placed horizontally, whether the block is to be cut across or along its entire length. It is the most convenient position for the push-saw. The fact, then, that the Egyptian always placed his wood upright argues that he employed a tool somewhat different from the modern form.

Practical experiment shows that, while it is quite possible to saw through a piece of wood in either position with either type of saw, it is much easier to use a push-saw on a horizontal, and a pull-saw on a vertical, piece of wood. So from the consistently upright position of his wood it must be inferred that the Egyptian used a pull-saw. Experiment has also shown that, with the wood upright in sawing, the tip of a push-saw constantly tends to turn downwards, whereas when a pull-saw is used the tip as consistently points upwards.

Again, when cutting at breast- or even waist-level, practical experience has discovered that with the hands at these levels it is fairly easy to pull strongly, but less easy to push. It is also important to note that the man not only stands well back from his work, but usually also bends well forward (fig. 3). If he had to exert his main strength in a pushing movement, such a stance would be both tiring and unnecessary; but if he were pulling, then both the distance and the bent body would increase the preliminary force of the pull.

The position of the hands is interesting. Occasionally both hands are placed on the handle, but more often one hand is actually on the back of the blade itself. This would be of no service with a push-saw, but might possibly be of advantage in pulling. It is likely, however, that a pad of some sort in the palm of the hand was necessary, to give both grip and protection.

An interesting model of a carpenter at work, with the position of the hands clearly shown, is published by Firth and Gunn, *Teti Pyramid Cemeteries*, pl. 29. In this model the disproportionate length of the saw is also very noticeable. These long saws are sometimes shown in the tomb scenes (Newberry, *Beni Hassan I*, pl. XXIX). They may possibly have been more practical than the shorter saw for cutting through tough wood.

Although the final proof can only be obtained with the discovery of a complete saw, a consideration of all the foregoing points makes it clear that, even if in later times the Egyptians knew of the push-saw, they always preferred from early times to use the pull-saw.

MARGHARITA LANE.

NOTE ON INSCRIBED AMULETS IN EGYPT.

THE Egyptians in prehistoric times made models of objects as amulets, both for personal wear and to place in tombs. Engraved figures began to supplant these in the dynastic ages. Thus we find actual beetles buried, many in a jar, in prehistoric graves; and later, in the Ist dynasty, there was a model beetle in alabaster, hollowed out to encase the animal.

In the IIIrd dynasty scarab models began to appear, bearing kings' names on the base. The most conclusive are those of Sneferu, on which his name is written S-nefer-r-f (whether from grammatical construction, or from precedence of the human sign). This spelling is only known on contemporary sculpture, while, later, S-nefer-f-r was the regular form. The style of work of the Old Kingdom scarabs is unlike that of any later time, and is much finer in its details. The occasional late copies of early names are quite different in fabric. The subject has been confused by three kings of the XXVth dynasty age taking the names Men·ka·ra, Nefer·ka·ra, and Men·kheper·ra; their scarabs are quite independent of those of the earlier kings, and are in a different style.

The button amulets begin with little shapes bearing figures akin to those of the Libyan rock carvings, and are unknown before the late Vth or VIth dynasties. There was often—and perhaps always—a subject race in each age of Egypt, keeping up its own fashions, as, for instance, the typical Magdelenian long flakes which were contemporary with the finest ripple flaking of flint knives. The lower race kept up its style on amulets in the Old Kingdom, and this rose to the surface and became prominent in the democratic outbreak at the decadence of the VIth dynasty, and under the Caucasian-Syrian kings of the VIIth and VIIIth. Such is the history of stamp or button amulets, so far as the facts are yet known. But the presence in Egypt of types of buttons exactly like some of North Syria and Babylonia shows that the Syrian invasion of the VIIth dynasty brought in northern designs for buttons, though the button may have originated in Egypt independently. I fear that deducing the scarab from the later button will confuse the historical evidence.

FLINDERS PETRIE.

[See Hornblower, *A Temple Seal and Its Connections*; ANCIENT EGYPT AND THE EAST, Dec., 1934.—ED.]

REVIEWS

The Treasure of Lahun. By H. E. Winlock. Pp. 80, 16 pls. 1934. (Metropolitan Museum of Art, New York.) $6.00.

This is a detailed study of the great find of jewellery from Lahun, now in the Metropolitan Museum of New York. The original account of the excavation and of the objects was published in the twenty-seventh memoir of the British School of Archaeology in Egypt in 1914, and Mr. Winlock explains in his preface why a further study of the find has become necessary. He devotes a whole chapter to the number and size of the caskets which must have held the jewels; and shows, from the position in which the objects lay as well as from the scraps of related and unrelated inlay, that there must have been five boxes; the personal jewellery in one, the alabaster perfume vases in the second, the obsidian vases in the third, the crown in the fourth, and the ceremonial wigs in the fifth. The whole chapter is a fine piece of reconstruction. An interesting point is that enclosed in the large cowrie and leopard-head girdle-beads were little pellets of stone or copper which make a tinkling sound against the gold when gently shaken. In the appendix are the analyses of the bronze and silver objects, as well as the contents of the cosmetic and oil vases. Altogether this is the finest study of a group of royal objects yet published, and will serve as a book of reference to all archaeologists. M. A. M.

The Bucheum. By Sir Robert Mond and Oliver H. Myers. With chapters by T. J. C. Baly, D. B. Harden, J. W. Jackson, D.Sc., G. Mattha, and Alan W. Shorter; and the Hieroglyphic Inscriptions edited by H. W. Fairman. 3 vols., pp. 203, 92, pls. 172. Egypt Exploration Society. 1934. (Oxford University Press.) 42*s.*

This is an important publication for several reasons. The material is late in date, ranging from Nectanebo II to the emperor Diocletian; it therefore covers a period which, in Egypt, has been extraordinarily neglected. In these three volumes the authors give a detailed study of the stelae, the brickwork and the burial objects, with special reference to the dating; a contrast to the majority of excavating records which barely mention Ptolemaic and Roman remains. Besides these details, Mr. Myers has also worked out the ritual of the embalming of a divine bull, partly from the papyrological records, partly from the evidence of the Buchis mummies and the embalming implements found in the Bucheum. The result is a clear exposition of the whole process. The excavation of the Baqaria, as Mr. Myers calls the cemetery where the mothers of the divine bulls were buried, is of interest as it is the first time that such a cemetery has received attention. Mr. Myers devotes two chapters to the architecture and brickwork, with a discussion on the unit of measure and three pages of tables of the sizes of bricks. The second volume deals with the inscriptions —hieroglyphic, demotic, Greek, and Coptic. Except for some information as to the burial rites of Buchis and a few historical points the inscriptions add little to our knowledge of the subject or period, though the translations were made by such competent scholars as Fairman, Mattha, Hunt, and Crum. The plates in Vol. III illustrate every aspect of the work; the individual photographs and line drawings are adequate for the purpose but the general arrangement of the plates is unpleasing. There is one sentence in the book which must give a shock to any excavator who reads it, " there was not anyone in camp with a technical knowledge of pottery, and of the many people who drew the pots

published, not one had ever drawn a pot before he came to Armant". In these days of training schools in archaeology this statement can only mean that a party of men, untrained in that important branch of archaeology, were let loose on a site and that valuable evidence must have been lost for ever. It is to be hoped that before long such loss of evidence, even though due to ignorance, will be regarded as little short of a crime, and that the archaeological authorities in every country will take steps to prevent any but fully trained persons from carrying out excavations. In spite, however, of the loss to our knowledge which has occurred, the book has preserved for us a very great deal of information of a neglected period. It is a book which no archaeologist can be without, particularly the Egyptologist, for whether he be interested in the Ptolemaic and Roman periods or not, he will find a great mass of material on which to work. M. A. M.

Excavations at Kish. Vol. IV, 1925–30. By L. Ch. Watelin and S. Langdon. Pp. vii, 72, pls. XLV, and 7 text figures. 1934. (Paris: Paul Geuthner.)

This very welcome addition to the archaeology of Kish is the last contribution of M. Watelin on the excavations of that site, for that distinguished savant died in January, 1934, whilst on his way to Easter Island.

The book deals largely with the deep excavations N.W. of the great Ziggurat of Hursagkalamma which were made by M. Watelin, who despite great difficulties, and in some parts working with the aid of pumps beneath water-level, unearthed much of the early history of this part of Kish.

Below a red stratum, averaging 1·5 metres in thickness, an almost sterile layer resting on a bed of clay extends all over eastern Kish below plain-level. Beneath the clay, which had been deposited by a flood, buildings were found to extend down to water-level some six metres below the surface of the alluvium.

The earliest traces of human occupation were microlithic implements (mainly borers), which M. Watelin suggests were manufactured by a people that moved from the Syrian plain when that area became arid. These implements were associated with ash-beds, averaging 0·30 metres thick, accompanied by fragments of fresh-water mussel-shells, some of which had served various purposes, and were perforated, and even strengthened with bitumen.

Immediately above this ash layer evidences of the Jemdet Nasr Period included pottery and other objects, lying about half a metre below the level of the sub-soil water. Between the water-level and the overlying thick flood bed of clay, already mentioned, which M. Watelin suggests on excellent evidence was laid down *c.* 3,000 B.C., were unearthed Cemetery Y and the earliest buildings that have as yet been found at Kish.

These buildings below flood-level were well planned structures, and a definite street was found and well thought out drainage systems. They were built of mud bricks of plano-convex type, and baked bricks of the same type had been used for the pavements. In some of the rooms there were coarse flint implements, such as borers, scrapers and sickle blades, together with small fragments of copper. The people who built these habitations had been flooded out more than once, but returned to repair their homes. They made roughly modelled bitumen figurines of bearded men with long hair, of a type definitely Sumerian, and also models of various animals. One of the most interesting objects found was a pottery two-wheeled chariot with seven model equines, five of which seem to have been "surplus to establishment".

In the same layer was found a cemetery (Y), in which the graves contained unpainted pottery that is said to be of the same date as the houses. Some of the bodies lay in the rooms of the houses in a half-crouched position, and they were wrapped in mats. With the bodies were laid the ornaments and other belongings of the dead, in no definite position except for a cup held between the hands near the face. It appears that copper was the only metal used for the daggers, lance-heads, chisels, axes, saws, and fish-hooks that lay with the bodies. Stone implements, including knives, celt-axes and sickle blades, were also found in these graves. That copper was plentiful and had other uses at this period is shown by ornamental supports, made expressly to hold metal and stone vessels.

Remains of wooden chariots were found in some of these "Y" tombs, and the forms of some of the metal implements and of many of the other objects in them, such as rein guides, would equate them with the "gold" burials at Ur. It is therefore interesting to see that M. Watelin, independently, would assign his "Y" Cemetery to the same date as Dr. Woolley does his royal tombs, namely, 3,200 B.C.

The red stratum above the flood layer, I should like to mention here, was found also to occur around the ziggurat of Kish. Few objects were found in this red stratum which is composed of fine particles of decomposed burnt brick, the most noticeable being an engraved schist plaque, fragments of statuary and a very fine painted pottery head (Pl. XXX). Professor Langdon is inclined to date this head to the Jemdet Nasr Period, but to this M. Watelin does not agree. There is a remarkable facial resemblance between this head and the royal figure on the slate and limestone plaque that was found in the Palace at Kish, and I have no doubt myself that both pottery head and plaque belong to the Early Dynastic Period. In the red stratum were also found sporadic graves of the "A" Cemetery period, but judging from their contents these were the tombs of wealthier people.

On pp. 59–64 of this book Professor Langdon deals with the epigraphy and seals of the "Y" Cemetery. A most interesting appendix by T. K. Penniman (pp. 65–72) on the inhabitants of Kish before the flood starts with the statement that the cranial evidence proves a mixed race at all periods at Kish, including the Eurafrican, the Mediterranean, and the Armenoid. So far, however, the Mediterranean type has not been definitely traced at Kish before 3,100 B.C.; but a large amount of skeletal material from this level still remains to be examined, and both Mr. Penniman and Dr. Buxton think that this type will prove to be as common as the other two.

One could wish that an archaeological book of this nature had been provided with an index; even a list of the plates is omitted. E. M.

Topographical Bibliography of Ancient Egyptian Hieroglyphic Texts, Reliefs, and Paintings: Vol. IV, *Lower and Middle Egypt* (Delta and Cairo to Asyut). By BERTHA PORTER and ROSALIND L. B. MOSS, B.Sc. Pp. 294. 1934. (Clarendon Press.) 35*s*.

This is the fourth volume of a stupendous bibliography of all known texts, reliefs and paintings of Ancient Egypt. The first and second volumes dealt with Thebes, the third with Memphis and its important cemeteries; the present volume covers the Delta and the Nile Valley as far south as Asyut. The accuracy of the work is astounding, in all the thousands of references the number of mistakes is practically nil, so that these volumes are of the utmost value to

all Egyptologists for reference purposes; and in saying that the present volume is as good as its predecessors one can bestow no higher praise. Maps of the Delta, the Fayum, and the river valley from Cairo to Asyut, as well as sketch maps of sites and plans of tombs, add to the value of the book. The indexes include names of kings, periods, royal and private names, and lists of divinities, besides a geographical index. Both authors may be congratulated on keeping up the high standard which they themselves set in their previous volumes.

M. A. M.

Ancient Egyptian Materials and Industries. By A. Lucas. Pp. xii, 447. 1934. (London: Arnold.) 16*s.*

This book is a second edition of a smaller book, "Ancient Egyptian Materials," which Mr. Lucas wrote some years ago. A great deal of new matter has been incorporated as a result of the many discoveries made in Egypt in recent years.

Not only is this volume of great value to the archaeologist; it should be found in every technical library, if only to prevent statements by the uninformed that the ancient Egyptians knew processes and dealt with materials that we now know could not have been the case.

Each of the fifteen chapters deals with a different aspect of the crafts that were practised and the materials used in ancient Egypt, which facilitates easy reference to the subject required. The last chapter, an historical summary, is a very important part of the book; and it is followed by an appendix in which are collected a number of useful analyses by the author and other experts, which have already appeared from time to time in various journals.

The reviewer, who long since left archaeological work in Egypt for excavations in other countries, has everywhere found Mr. Lucas's earlier book of the utmost value; the usefulness of the present volume will be the greater that the principal civilisations of the ancient East are now known to have traded very extensively with one another. That they drew supplies from sources that it had not previously been realised they knew has been revealed by excavations all over the East. The ancient civilisations were linked up by trade and through that medium were well acquainted with one another.

I cannot think that many further materials remain to be found in Egypt, and it is to be hoped that one day Mr. Lucas may be able to devote his great talent to similar studies in other countries where excavations are proceeding—in Palestine and Syria, Persia, Iraq, and India.

This is by no means a book that only experts can comprehend; it is thoroughly readable throughout and full of interest to the layman, even though he have only a superficial knowledge of the subjects dealt with by the author.

E. M.

The Preservation of Antiquities. By H. J. Plenderleith. Pp. viii, 71; pls. II, 5 text-figures. 1934. (Published by the Museums Association, London.) Price to non-members, 2*s.* 6*d.*

Dr. Plenderleith is to be congratulated on this little book. It is one of a series dealing with matters of interest to the museum curator, for whom it is primarily intended. Yet though much of the apparatus to be used could hardly be found in an archaeological camp, many of the receipts and processes given will be of the utmost use in the field. Indeed, this very inexpensive book should form part of every camp library. No longer is it to be regarded as sufficient after the extraction of an antiquity from the soil to pack it up in an untreated

condition for transport abroad. In several instances lately, boxes of antiquities have been delayed for months in transit under conditions which have not conduced to the safe preservation of their contents. Dr. Plenderleith tells us in clear language what should be done to ensure the safe arrival of objects at the museum, where they can, if necessary, receive a final treatment.

The book is not only of interest to the expert at home and to the field archaeologist; librarians and collectors of furniture and textiles will also find in it much of profit. A full bibliography and an adequate index complete a most valuable collection of practical information. E. M.

Messrs. Lovat Dickson and Thompson have been well advised in issuing a series of small books on archaeological subjects. Such summaries, written by competent authorities, are greatly in demand, and the venture should be a success. The first two books of the series are reviewed below.

Tell el-Amarna. By J. D. S. Pendlebury. Pp. 175, 8 pls. 1935. 6*s*.

This is a convenient summary, written in popular form, of all the known facts and many of the theories concerning the site and the personages of el-Amarna. The general reader's sentimental interest in Akhenaten is probably due to that Pharaoh's supposed monotheism and his revolt against the established religion; the epithet of "the Heretic King" has a romantic appeal. The wealth of Tutankhamen's burial also strikes the imagination, and the sorrowful beauty of Nefertyti's portraits rouses the sympathy, almost the affection, of the modern world. A book on el-Amarna by Mr. Pendlebury is therefore very welcome and should be widely read.

The Indus Civilisation. By Ernest Mackay. Pp. 202, 16 pls. 1935. 6*s*.

This is the first complete summary of the finds from Mohenjo-daro. The author, unlike many archaeologists, has resisted the temptation to write in a journalese copied from the lesser magazine writers, but regards the general reader as a person of some education and common sense, with the result that the book is not only interesting for the layman but is a storehouse of facts for the specialist. Dr. Mackay is to be congratulated on this achievement. M. A. M.

The Desert Fayum. By G. Caton-Thompson and E. W. Gardner. Royal 4to, Vol. I, pp. 167, text; Vol. II, pls. CIV. 1935. (Royal Anthropological Institute, London.) 30*s*.

The scientific spirit is too seldom exhibited in archaeology even to-day. The present volume is valuable, apart from the information it contains, because it is permeated by that quality; much that was remote from the original enquiry has been thoroughly investigated and described by the authors and their work has been worthily rewarded.

The most important parts of the book are the geological study of Lake Moeris and the description of the Neolithic cultures which developed on its borders. It is shown that the history of the lake since Neolithic times has been one of intermittent contraction. Ptolemy Philadelphus did not drain the lake to provide land for his soldiers, but constructed a series of irrigation works—obviously a more sensible proceeding. The writers demonstrate that the "quay" at Dimai is "the free-standing portal of a long processional approach through the town to the temple precincts". Despite the strength of the opposition to these views, the evidence, which is clearly presented, appears irrefutable.

Only the settlements of the Neolithic peoples were found, extensive search for the cemeteries unfortunately proving fruitless. Nevertheless, much of interest was established, though the exact connections with the Middle and Lower Egyptian Early Predynastic II (Tasian and Merimdian) cultures cannot be made as yet. An important feature of the lives of these Neolithic people was agriculture, though they also fished in the lake and hunted its borders. With the exception of their ceramic industry, they appear to have been further advanced than the (probably) contemporary cultures in the Nile valley, but the evidence is at present slender.

Remains of the Old and Middle Kingdoms are recorded, and much of importance from the Graeco-Roman period. There are some excellent typological and technological studies Even in these full volumes there are one or two omissions, the most notable of which is that of the metrology, the dimensions of the buildings excavated and described. The plans are exceptionally good.

O. H. M.

Mareotis, being an Account of the History, Topography, and Antiquities of the North-Western Desert of Egypt and Lake Mareotis. By Anthony de Cosson. 8vo., pp. 219, 16 pls., 5 plans and maps. 1935. (London: Country Life, Ltd.) 15*s*.

However absorbing the more technical aspects of archaeology, it is pleasant sometimes to turn aside to a more general view of a site, its people and history. Mr. de Cosson has a passionate interest in the district he is describing, and in all that bears on it, and, though he has not command of the vivid phrase of a Kipling or Wells to bring the past breathtakingly into the present, he has yet a pleasant and persuasive style.

The book divides roughly into two sections, the first historical, the second geographical, and a more deliberate distinction, with chapters XVIII to XXIII redistributed, would have made for greater compactness. The author has consulted all possible authorities from classical to modern Egyptological for any information they might give, and has probably placed on record everything that is yet known about the area. In fact, it is impossible not to feel that the information might have been given in a smaller space. There are some useful appendices, including an analysis of glass slag and, notably, a contribution on the flora of the region by Professor Oliver. The plans are clear and the plates excellent. The Arabic transliteration might have been more systematic, the use of the letter *p* being misleading.

Mr. de Cosson must be congratulated on having compiled a very readable volume of useful information. It is to be hoped that this book will encourage systematic archaeological research in the district, and that Mr. de Cosson will one day write a new history of it—with the gaps filled. This book is as sound a foundation for future work as any excavator could desire. O. H. M.

Work in Western Thebes, 1931–33. By Harold H. Nelson and Uvo Hölscher. With a chapter by Siegfried Schott. Pp. 118, 62 illustrations. 1935. (The Oriental Institute of the University of Chicago: Univ. of Chicago and Camb. Univ. Presses.) $1.50.

This is a summary in a cheap and convenient form of the work done at Medinet Habu during three years. The first part is a study of the calendar of feasts with the offerings for each feast. Though not by any means exhaustive, the study is interesting and raises as many problems as it solves. The second

part deals with the excavations of the western fortified gate, the western chapels and the temple of Eye and Harmhab. These excavations conclude the architectural work of the American expedition. Dr. Hölscher gives merely the preliminary account of what was done ; the full account with all details of buildings and of the objects found will be published in one of the magnificent volumes of the Oriental Institute of Chicago. M. A. M.

Prehistoric Survey of Egypt and Western Asia. Oriental Institute Publications, University of Chicago. Vol. II. *Palaeolithic Man and the Nile Valley in Nubia and Upper Egypt.* By K. S. Sandford and W. J. Arkell. 1933. 28*s.* 6*d.* Vol. III. *Palaeolithic Man and the Nile Valley in Upper and Middle Egypt.* By K. S. Sandford. 1934. 31*s.* 6*d.*

At a time when floods loom large in the discoveries of excavators, and "pluvial" and "interpluvial" periods are suggested to explain various phenomena and the mass migrations of early man, a restrained and well balanced account of purely geological evidence is invaluable. Of the geological survey of Egypt and Western Asia undertaken by the Oriental Institute of Chicago, these two volumes by Drs. Sandford and Arkell, the second and third in the series, will be indispensable to both geologist and archaeologist ; to lovers of the Egyptian landscape also they provide a fascinating commentary on the colours and contours of the desert scene.

In Volume II, an interesting chapter by Dr. Arkell deals with rock pictures of the Nile valley from those early times when the giraffe seems to have been known, but not the camel, down to modern days. In the chapter on Human Industries, Dr. Sandford most usefully examines the dating of implements, which were all found *in situ* in the various "terraces", by geological means rather than by their types ; and he correlates the "terraces" with the Mediterranean beaches.

There is evidence that "Nubia had lost its rainfall by Lower Sebilian times," whereas the rainfall "had virtually ceased in Upper Egypt by Upper Sebilian times." In Vol. III, we read further that "there seems to be agreement that rain was falling in the Fayum in Mousterian times. The Nile and its tributaries certainly point to the same conclusion. . . . Although the climate was changing radically in the south and the change was creeping northward, the north as a whole was not yet a desert, but was beginning to enter a stage of deficient run-off of surface water. This became more marked as the Nile's aggradation progressed." A careful review of the Fayum controversy follows.

Dr. Sandford accepts "the general figure of 4–4½ inches per century (for the deposit of the Nile alluvium throughout the historic period) as almost the only fact of archaeological or geological importance that we really know concerning the bed of the Nile."

Aurignacian work has as yet only been identified in one spot (near Nag^{c} Hammadi). The Hilwan industry, probably a phase of Capsian, seems to have long preceded the Neolithic age in Egypt, and pages are missing from the pre-Neolithic history of the Nile valley.

In conclusion, Dr. Sandford emphasises the many climatic and ecological changes that mark the growth of absolute desert ; all vary locally from meteorological causes, and especially from the nature of the strata. He can "see no evidence or justification for defining its climate (that of the Nile Valley) in terms of 'pluvial' or 'interpluvial' periods". D. M.

JOURNALS.

Associazione Internazionale Studi Mediterranei. V, 4, 5.

Lake, Agnes Kirsopp.—*The Pottery Deposit at Minturnae.*—This is a careful and detailed study of black Campanian ware found in a dump of "wasters" from a pottery. The wide distribution of this ware over the Mediterranean area gives importance to this article, which is well illustrated. The alteration in colour of the black "glaze" is discussed. Miss Lake suggests that it is due to over-firing; but it is possible that the over-firing was intentional, as discoloration of the same kind is also seen in the Campanian ware found in Minorca. M.A.M.

Do. V, 6.

Capparoni, Prof. P.—*La malattia nell'uomo della preistoria e dell' antico Egitto.*—This interesting paper summarises present knowledge of palaeopathology, more especially in respect of ancient Egyptian evidence of disease.

Annals of Archaeology and Anthropology—University of Liverpool. Vol. XXI, Nos. 3, 4. 1934.

Brown, T. B.—*Achaean Pottery.*—The writer argues that "it is unreasonable to reject the possibility of an Indo-European Aegean at the beginning of the Bronze Age." He considers that the Achaeans of the Aegean were closely related to the people of the Hittite Empire.

Dussaud, R.—*Ras Shamra.*—A brief but important summary of the knowledge obtained by the excavation of the three uppermost strata during the six campaigns of 1929–34.

Garstang, J.—*Jericho: City and Necropolis.*—This fourth report on the excavations deals principally with the Palace Area, its storerooms and their contents, and with the painted pottery of the Middle and Late Bronze Age. A tablet bearing a few cuneiform characters proved to be most disappointingly damaged (possibly by the scribe), and is undateable, though probably not earlier than the el-Amarna tablets.

Journal of the American Oriental Society. Vol. 54, No. 4. Dec., 1934.

Sturtevant, E. H.—*A Hittite Text on the Duties of Priests and Temple Servants,* transliterated and translated, contains interesting matter even to the non-philologist.

Do. Vol. 55, No. 1. March, 1935.

Mainly concerned with the Ras Shamra liturgical poems and script. D.M.

Egyptian Religion. Vol. I, no. 3. October, 1933. (Publication of the Alma Egan Hyatt Foundation, New York.)

Dombart, T.—*Der zweitürmige Tempel-Pylon altägyptischer Baukunst und seine religiöse Symbolik.*—The two-towered pylon forming the entrance to Egyptian temples is explained as representing the horizon. The author brings forward a considerable amount of evidence in support of his theory.

Piankoff, A.—*Nefer-Toum et Mahes.*—By association with Mahes, Nefertum came to be represented as a lion-headed god. Mahes is sometimes shown as a lion attacking from behind a prisoner whose hands are bound. The origin of this group is to be found in military compositions of the New Kingdom.

Lexa, F.—*La légende gnostique sur Pistis Sophia et le mythe ancien égyptien sur l'œil de Ré.*—The writer traces a resemblance between the essential traits of the Gnostic legend of Pistis Sophia, of which he prints five chapters in transla-

tion, and the ancient Egyptian myth of the Wanderings of the Eye of Ra, and suggests an explanation for the admission of this myth into the Gnostic system.

CAPART, J.—*Thème religieux ou fantaisie.*—Capart describes and figures an ostracon with a queen, Merit-Amen, reaching out a hand to a duck, which, judged by itself, would seem merely to register an idle moment, were it not that a somewhat similar scene on a relief in the Temple of Edfu showing the Pharaoh with a duck has been described as probably one of the episodes in the ceremony commemorating the victory of Horus, which was celebrated on the 21st of Mechir of the Edfu Calendar.

Do. Vol. II, no. 1. January, 1934.

BOESER, P. A. A.—*Some Observations on a Moral Text in Demotic.*—This papyrus was purchased in 1895 by the Rijksmuseum van Oudheden in Leiden. It contains many close parallels with passages in the Psalms and Proverbs and, above all, in Ecclesiasticus.

HALLOCK, F. H.—*Christianity and the Old Egyptian Religion.*—The writer concludes that "Christianity is in no essential respect different from what it would have been had there been no preparation for it on Egyptian soil; at the same time, there was, in Egypt as elsewhere, preparation, and Christianity is the richer by the contribution of its forerunner." This article is disfigured by printer's errors, such as "Pharoah."

Do. Vol. II, no. 4. October, 1934.

SUYS, É.—*Les Messagers des Dieux.*—As the religion developed, evil spirits no longer only menaced the dead at the entrance to the next world, but they invaded this world either spontaneously or at a god's command. The only weapon that could be used against them, once they had gained free access to this world, was magic. This article was in the press before the author had seen the Edwin Smith Papyrus; in the incantations at the end of this papyrus, the executioners in the following of Sekhmet, far from confining themselves to the other world, as in Chap. 145 of the Book of the Dead (Papyrus of Katseshni), play an important part in spreading disease, especially the "pestilence of the year."

BISSING, FREIHERR W. F. VON.—*Eine Stele des Horus auf den Krokodilen aus einer Aedicula Konstantinischer Zeit.*—There is a small illustration of this stela in Stuart Jones' *Catalogue of the Ancient Sculptures preserved in the Municipal Coll. of Rome, Palazzo dei Conservatori*, pl. 119. On this stela the figure of Horus is crowned with a large head of Bes; the remarkable feature of the representation is the presence of two animal's ears on the head of Horus, perhaps an animal's hide on which the head of Bes rests. Von Bissing considers that these ears must have been transferred to Horus from the dwarf god Ahati (see Ballod, *Prolegomena zur Gesch. d. Zwerghaften Götter in Aegypten*, pp. 27 ff., 71 f., 86 f.).

ORIENTALIA. Vol. II, Nova Series, Fasc. 3. 1933. Rome.

POLOTSKY, H. J.—*Ephraem's Reise nach Aegypten.*—In the Syriac *Vita* of Ephraim, the saint is said to have stayed eight years in Egypt. This detail is not confirmed by any other source and is in itself improbable, and the journey to Egypt has, therefore, been considered legendary, though no satisfactory reason has been given for the rise of the legend. The writer offers the following explanation: There are two texts of the Syriac *Vita*, of which one, the Vatican, states that at the beginning of his stay Ephraim first visited the

hermit Pishoi and spent a week with him. The writer considers that the *Vita* borrowed this incident from the Syriac *Life of Pishoi*, where (in the Greek translation) Pishoi's visitor is referred to without a name as a hermit from Syria.

Do. Vol. III, Nova Series, Fasc. 1. 1934.

Karst, J.—*Aïa-Kolchis et les Chamites septentrionaux.*—The writer finds a basis of truth in the statement of Herodotus (II, 104) that the Euxine Colchians were Egyptian.

Suys, É.—*Le papyrus magique du Vatican.*—The Catalogue of the Vatican Museum (O. Marucchi, *Il Museo egizio vaticano*, Roma, 1902, p. 283) mentions under no. 19a some fragments of papyri of the XIXth-XXth dynasty, of which Erman transcribed the first page and gave a translation in *Zeitschrift* XXXI, 1893, pp. 119 ff. The papyrus is now to be detached from its backing so that the fragments may be arranged in their correct order, when the verso, which is covered with magical formulae different from those of the recto, will be available for publication. An attempt to translate the only passage of the verso which can be read is made here. The recto, of which a provisional study is published in this article, contains incantations exorcising a poison, whose power is checked in each limb by the god who occupies the limb. These incantations are preceded by an account of the hastening of Horus to the aid of Set, who has been poisoned; Horus cures Set by his magic and by his ministrations.

Do. Vol. III, Nova Series, Fasc. 2. 1934.

Simon, J.—*Le culte des XL Martyrs dans l'Égypte chrétienne.*—Evidence is collected in this article to show the popularity of the Forty Martyrs of Sebaste in Christian Egypt.

O'Leary, de L.—*A Greek Hymn in a Coptic Manuscript.*—On ff. 117, 118 of the Codex in the Bibliothèque Nationale in Paris, which is numbered *Copte* 129^{20}, is "an alphabetical hymn on the Resurrection, in what is intended for Greek, not a corrupt copy of a Greek composition. It is the result of an attempt on the part of a Coptic writer to put together a hymn in Greek words, of a type by no means unknown in Coptic manuscripts. It seems impossible to restore a coherent Greek passage from material of this sort, but the general sense seems fairly intelligible." L. B. E.

Zeitschrift für Aegyptische Sprache, LXIX, Part 1. 1933.

Steindorff, G., Ricke, H., and Aubin, H.—*Der Orakeltempel in der Ammonsoase.*—This article embodies the result of preliminary excavations at Aghûrmi, the supposed site of the temple of Amon in the Libyan desert. The temple was not Egyptian in origin, but had been given an Egyptian appearance by conversion later, at an unknown date. The wall paintings and texts are very corrupt and probably not of Egyptian workmanship. The cult object in the temple is known from ancient accounts to have been an *omphalos*, and Steindorff holds that the finding of an *omphalos* at Napata (*J.E.A.*, III, 255) supports the view that the oracle in the oasis of Amon was founded in the Ethiopian period.

Reisner, G. A., and Reisner, M. B.—*Inscribed Monuments from Gebel Barkal. Part 2. The granite Stela of Thutmosis III.*—A description of the stela found in the first court of the great temple of Amon at Barkal (B. 501). The text is given and translated in full: the crossing of the Euphrates, the invasion of Naharain, the battle, siege, and surrender of Megiddo, etc. The first

part of this article appeared in ZEITSCHRIFT, LXVI (see ANCIENT EGYPT, 1932, iv, p. 121).

WOLF, W.—*Neue Beiträge zum "Tagebuch eines Grenzbeamten."*—A further study of the notes on the verso of columns 6 and 5 of Anastasi Papyrus III, known as the "Diary of a Frontier Official," in the reign of Merenptah. The writer's translation of 6, line 9, shows that the Court was in Egypt in this year, so that it is no longer necessary to assume that Merenptah was on a campaign in Syria then, as was believed from the earlier reading.

ROEDER, G.—*Die Herstellung von Wachsmodellen zu ägyptischen Bronzefiguren.*—The writer observed that bronze figures of gods, animals, etc., show joins which always occur at the same places. From a study of these lines of suture he has worked out the Egyptian method of casting bronze from wax models. The wax models for the various parts of the figure were prepared in plaster moulds composed of several parts. Unfortunately, none of these moulds have as yet been found dating to Pharaonic times; nor do the plaster moulds from Memphis throw light on the Egyptian method of casting, as they were used by workers trained in the Greek school. The wax models thus prepared were used for casting solid figures. All but the very small Egyptian bronzes were made by a combination of solid and hollow casting, and the writer adds a hypothetical account of the Egyptian process of hollow casting.

SACHS, C.—*Eine ägyptische Winkelharfe in der Berliner Musikinstrumentensammlung.*—This harp corresponds in every detail with one in the Louvre. It has been left in the state in which it was found; a restored copy has been made which can be played upon, knowledge of the strings and pitch having been gained from a relief of Assurbanipal in the British Museum.

GARDINER, A. H.—*The supposed particle* .—This particle occurs only in the collocation ; it is here considered to be an abusive variant of . L. B. E.

ZEITSCHRIFT FÜR AEGYPTISCHE SPRACHE, LXIX, Part 2. 1933.

REISNER, G. A., and REISNER, M. B.—*Inscribed monuments from Gebel Barkal.*—A badly preserved stela (Monument No. 20 in writers' list) was found in the great temple of Amon in the third hall of columns (B. 503). There is no definite indication of the original place of the stela. It was found face downwards, having been used as a paving stone, and is in three disjointed fragments. These have been reconstructed and yield twenty lines of inscription, but only the last line is completely preserved. The figures and inscriptions of the top of the stela are in relief, carved in the well known style of Sety I, but they are not of the fine quality of the contemporary monuments in Egypt; the workmanship is entirely different from that of the inscription below, and may be by quite a different hand. The date, year 11, is certain; it is the latest known date of Sety I, seven years later than that of the great inscription at Nauri (Griffith, *J.E.A.*, XIII, p. 193).

SENK, H.—*Vom perspektivischen Gehalt in der ägyptischen Flachbildnerei.*—If reproduction in a three-dimensional sense is meant by drawing in perspective, then it is true that the Egyptians never used perspective. But the writer argues that an effect of perspective is aimed at in Egyptian sculptures in relief, a compromise between following and rejecting the laws of true perspective. Egyptian reliefs show, in fact, a special kind of perspective drawing in combination with the drawing of objects as they really are. Plate IX, fig. a, is particularly instruc-

tive, showing different planes, reduction in size of figures, and movement towards the interior of the picture.

PIEPER, M.—*Ägyptische Kunst und Vorderasien.*—A short essay on the importance of scarabs in ancient art-history, with an illustration of a Hyksos scarab (Berlin 19691) showing a falcon-headed man kneeling on one knee, an attitude well known in Greek art and also earlier (Crete and Babylonia).

BISSING, FR. W. VON.—*Gefässmodell aus Leontopolis.*—In the vases discussed in this article the vase portion is held in the fore-paws of a lion. Two specimens are from the Fouquet Collection, two are at Berlin, and the remaining one is a limestone model now at The Hague. The writer suggests that they may be dated to the last pre-Ptolemaic period and are to be regarded as the final flicker of native Egyptian art.

SPONSHEIMER, H.—*Frühgriechische Parallele zu ägyptischer Zeichenweise.*—Fig. 104 in Schäfer's *Von ägyptischer Kunst*, 3rd edition, reproduces a mummy case on which the vulture's head painted on the breast is shown projecting from the case as if it were modelled. The writer illustrates and describes a scene on a Greek vase in which the head of a serpent encircling a shield is rendered in the same way.

RANKE, H.—*Eine alte Anspielung auf den Mythos von Horus und Seth.*—It is difficult to make sense of Pyr. 128b as it stands: "As Set spurns the *mt* of these two companions who traverse the sky." Proceeding from Pyr. M and N, which give a different reading, Ranke supposes that the passage was originally in two parts, the second part being addressed to "Ye two companions who traverse the sky," whilst the first part would have read, "As Set spurns the *mt* of his companion" (*i.e.*, the *mtwt* of Horus (for which, see Gardiner, *Chester Beatty Papyri*, No. 1, Pls. 11, 8/9, 11, 12, and 12, 9)). If this be correct, then the VIth dynasty pyramids may occasionally preserve an older and better version than Unas, and we may have to reckon with extreme corruption even in the Pyramid texts.

WOLF, W.—*Zur zweiten Auflage von Ermans Neuägyptischer Grammatik.*—Some twenty-seven passages in the second edition of Erman's New Egyptian Grammar are discussed here.

TILL, W.—*Der Irrealis im Neuägyptischen.*—If the first clause be an unfulfilled wish, there is nothing in the following clause to indicate the unreality of the statement. In every other case the main clause must be introduced by , whilst the preceding clause as a rule contains no indication of unreality. Following are Present II, Future III, or .

SETHE, K.—*Ein demotischer Prozesseid.* (*Ostrakon der Sächsischen Landesbibliothek im Dresden.*)—The special interest of this ostracon lies in the last three lines, which may be translated, "Herieus, her husband, has sworn in her hand, this oath is a true one". The reading "in her hand" elucidates a phrase on other ostraca with oaths, of which Sethe and Spiegelberg have given differing translations.

EDGERTON, W. F.—*Demotic writings of* ⲙⲡⲁⲧⲉ.—Discussions of the etymology of the Coptic tense ⲙⲡⲁⲧⲉⲓ ⲥⲱⲧⲙ, "he has not yet heard," have been unfavourably affected by an alleged demotic group said to occur in the demotic P. Ryl. IX, 3.3. The writer is now convinced that no such form occurs either in 3.3 or elsewhere, and he submits that it is time to drop the elements □, *p*, and , *r*ᶜ, from our transliterations of the demotic examples.

L. B. E.

NOTES AND NEWS.

Among the King's Birthday Honours, the Knighthood conferred upon Charles Leonard Woolley will be greatly appreciated by archaeologists, not only for the honour bestowed upon a brilliant and indefatigable worker, but for the recognition it carries with it of a subject whose importance is now being more fully realised. The remarkable discovery made by Sir Leonard Woolley of the barbaric and magnificent funeral rites of the Sumerian kings made a deep impression on the popular imagination ; that find, however, represents but a small part of the unremitting labour that has unravelled the history of the city-state of Ur. In his work there for the last decade he has been most ably seconded by Lady Woolley, to whom with him we offer hearty congratulations.

In *Man* (March, 1935) Sir Charles Peers gives an interesting resumé of the Ancient Monuments Act (1934) of the Union of South Africa. Its provisions seem to be fair and satisfactory, and the establishment of a National Bureau of Archaeology with Mr. C. Van Riet Lowe as Director is welcomed. Sir Charles Peers suggests, however, that " to expect adequate administration from a body of unpaid Commissioners argues some inexperience in the framers of the Act " ; he regrets that " the experience of other governments was not taken into account in this connection."

In the latest *Bulletin* of the Museum of Fine Arts, Boston (1934), it is pleasant to read that the Joint Expedition to Persia directed by Dr. E. F. Schmidt has " received the closest co-operation from the Persian Government," which also " has been absolutely fair in the division " of the finds. Friendly co-operation between the government of the country where excavations are made and the excavators and their supporters results not only in an increase of knowledge of the past, it enriches the museums of both countries—as Baghdad has every reason to be aware—and gives local employment that is highly valued by the villages in the neighbourhood of the sites.

To the Metropolitan Museum of Art, New York, the Persian Government has granted permission to excavate at Nishapur, in Khurasan—yet another to be added to the important expeditions at work in that country.

In addition to its expeditions to Egypt and Persia, the Boston Museum of Fine Arts has now undertaken a third, to Chanhu-daro, in the Indus valley, some eighty miles southwards of Mohenjo-daro. This is a joint expedition with the American School of Indic and Iranian Studies, whose President, Professor W. Norman Brown, has just returned from a visit to India where he negotiated the arrangements for this excavation. The expedition is to be directed by Dr. E. Mackay.

Popular interest in the discoveries of archaeology in all parts of the earth seems not to wane. Such new fields as Ireland, Greenland, and Siam are now figuring beside the more familiar fields of the Near and Middle East, Europe, Central America, and East Africa. The illustrated monthlies and weeklies, notably *Discovery* and the *Illustrated London News*, publish excellent and authoritative reports of excavations for the general reader.

The first season's work of the Gaekwar of Baroda Greater-India Research Expedition, led by Dr. Quaritch Wales, has produced interesting evidence of the early eastward spread of Indian cultural influences.

OBITUARY.

SIR ERNEST ALFRED WALLIS BUDGE.

1857–1934.

THOUGH he will be remembered chiefly as Keeper of the Department of Egyptian and Assyrian Antiquities in the British Museum, an office which he held for over forty years, Sir Wallis Budge had in earlier days excavated various sites in the Near and Middle East. He wrote a number of books on Oriental subjects which did much to arouse the popular interest in archaeology that was later to be so greatly stimulated by the discovery of the tomb of Tutankhamen. The friendly interest shown by Sir Wallis Budge in the work of Indian archaeological students at the London University is appreciatively spoken of by them in India to-day.

BERTHOLD LAUFER.

1874–1934.

Archaeology was only one of the many interests of Dr. Berthold Laufer; yet it is fitting to pay tribute here to one whose loss is great not only to the Field Museum, Chicago, but to the world of scientific exploration. A great scholar, Dr. Laufer was particularly interested in the Far East, whither he had led four expeditions; but to him his extraordinarily diverse investigations all centred round one main idea, the history of the onward march of civilisation.

THOMAS EDWARD SHAW.

1888–1935.

Before the Great War, T. E. Shaw—Lawrence of Arabia—had already made his mark as an archaeologist. With his remarkable understanding of the East that had to be; even before he joined the British Museum expedition at work at Carchemish, at the instance of the late Dr. Hogarth, he had as an undergraduate wandered over Syria and Palestine in search of material for his thesis in his Final School. Not long before the war, Lawrence paid prolonged visits to Professor Petrie's camp at Tarkhan and the Palestine Exploration Fund's survey in northern Sinai, and proved himself a refreshing and charming personality. The excavator's life appealed to him, and on more than one occasion in recent years did he express regret at not returning to it. By his untimely death those archaeologists who knew him have lost, with many others, a true and inspiring friend.

LOUIS CHARLES WATELIN. Died January, 1934.
HERBERT WELD. Died February, 1935.

By these two irreparable losses the Oxford University and Field Museum, Chicago, Joint Expedition to Kish has suffered a dual blow. To Herbert Weld was due the initiation of the expedition in 1922, after he had visited Mesopotamia to discover what archaeological material might have come to light during the war. Professor Langdon undertook the organisation of the expedition at his behest, and during the last seven of its eleven successive seasons M. Watelin acted as its Field Director. A brilliant and untiring worker, he made extensive excavations at the eastern end of Kish, notably that of the Temple of the Earth-Goddess (Harsagkalamma), and of a Sassanian villa. He also continued the excavation of Jemdet Nasr, discovered by his predecessor. At the time of his death, M. Watelin was on his way to Easter Island to investigate its curious script, which has been thought to exhibit affinities to the Indus Valley script unearthed at Harappa and Mohenjo-daro.